COAL AGE

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The Coal Miner's Creed

I BELIEVE in the future of the coal industry; my mine and my job.

I BELIEVE that the time will come when the public will recognize wholly the usefulness of the coal-mining business and will give it the same liberal measure of cordial support that it gives other industries.

I BELIEVE the time will come when all operators will make a fair profit, nothing less, and when all employees will make a fair wage, nothing less.

I BELIEVE the time will come when wasteful methods will be eliminated, accidents reduced, operation steadier and more coal reclaimed.

I BELIEVE the time will come when all operators will be honest, when contracts will be filled to the letter and when substitution will be unknown.

I BELIEVE the time will come when all miners will desire to be efficient, honest and temperate workmen; when supervision will consist of directing alone.

I BELIEVE the time will come when miners will live in comfortable dwellings in clean towns.

I BELIEVE the time will come when employers and employees will live up to wage scales at all times.

I BELIEVE the time will come when miners and operators will understand that their interests are identical; when labor wars will cease.

I BELIEVE that all these conditions will come in time, and as the time seems slow in coming—

I BELIEVE I'll get behind all good movements now—and *push!*

Written by Geo. N. Lantz

Discharge Flow and Crank Effort in Various Pumps*

By J. E. Holveck†

SYNOPSIS—An analysis of the conditions existing in power-driven plunger or piston pumps. A proper arrangement of cylinders and cranks reduces the variation of torque from 318 per cent. in the single-cylinder single-acting pump to 7 per cent. in the single-acting quintuplex machine.

There seems to be some misunderstanding as to the actual fluctuation in discharge of different types of crank-driven reciprocating outside packed plunger pumps. This subject is clearly treated in a number of text-books on pumps, which show diagrams similar to those in this article, covering duplex and triplex machines. To the best of my knowledge and belief curves of the quintuplex, or five-cylinder, type have never heretofore been published; nor does the literature on the subject contain any figures showing what the variations in the different types are.

For the benefit of those interested in this subject I will endeavor briefly to outline the formula for determining and graphically representing the discharge variations in pumps most commonly used at the present time.

The action of water in a pump cylinder and discharge pipe is determined by the plunger moving in a straight line and connected to a crank pin having a constant, rotary motion. While the velocity of the crank pin is constant, that of the plunger varies throughout the stroke from zero at dead center to maximum, with the connecting-rod at right angles to the crank.

Knowing the velocity of the plunger, the displacement or discharge can be readily ascertained for every position of the crank pin, since the rate of displacement is directly proportional to the velocity of the plunger.

By using ordinates to represent rates of displacement in cubic inches and abscissa for time we may construct a true diagram graphically illustrating the discharge from a plunger. If the curves of each plunger for any multi-plunger pump are combined in proper sequence as to time, the discharge for any pump is determined.

Let

F = Area of plunger in square inches,

W = Radians per second or angular velocity of crank pin $= \frac{\pi N}{30}$

r = Crank circle radius in inches,

N = Number of revolutions of crank per minute,

u = Velocity of plunger in inches per second,

a = Crank angle,

L = Length of connecting-rod.

The equation for plunger velocity then is

$$u = Wr\ (sin\ a \pm \tfrac{1}{2}\frac{r}{L} sin\ 2\ a)$$

and

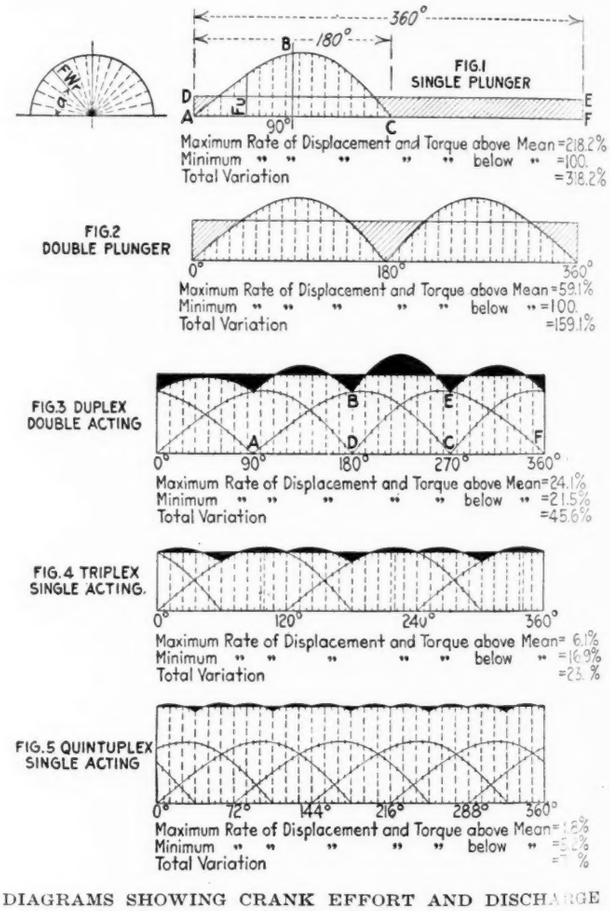
Fu = plunger displacement in cubic inches per second.

As the crank-pin velocity is constant, the time for any position of the plunger is a function of the crank angle,

$$t = \frac{a}{360}\,T$$

in which t represents abscissa or time elapsed until any crank angle has been attained and T represents the total time for one revolution.

Fig. 1 represents the discharge curve of a single-plunger single-acting pump. The circle at the left of the figure is laid out to any scale with a radius FWr, or the cubic inches per second of displacement, this being a function of the crank-pin velocity. The length of diagram or base line AF represents the time for one revolution, and is made equal to $FWr \times 2 \times 3.1416$.



DIAGRAMS SHOWING CRANK EFFORT AND DISCHARGE OF VARIOUS TYPES OF POWER-DRIVEN PUMPS

Lay off on this base line equal divisions corresponding to those in the circle and erect ordinates equal to the several values of Fu computed by above-cited formula. These ordinates are the rates of displacement in cubic inches per second corresponding to the respective positions of the crank. This will give the curve ABC. The mean ordinate of the curve multiplied by abscissa t, the time through 180° will give the total displacement

*Diagrams furnished through courtesy of Aldrich Pump Co., Allentown, Penn.

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for the discharge stroke. A to C is the discharge stroke and C to F the suction.

These diagrams illustrate also the tangential force or torque for every position of the crank. In this case the radius of the circle represents total load on the plunger and the ordinates the torque in pounds.

Superimposed Curves Show Action of Multi-Plunger Pumps

For more than one plunger it is only a matter of locating the curves in the diagram as they occur in the crank circle. Since crank-pin velocity is constant and the plungers are equally spaced on the crank circle, the curves must be equally spaced on the diagram by

$$t = \frac{a}{360} T$$

Fig. 2 represents a single crank double plunger pump (one crank, two plungers). Fig. 3 represents a duplex double-acting pump (two cranks, four plungers).

The irregularity of pulsation in Fig. 3 is due to the fact that with the plunger on the forward stroke the displacement is greater through the last 90° than the first, since the maximum velocity occurs with the crank at 99° 29′ 43″ of the discharge stroke and area *CBD* is greater than *ABD*. When discharging on the return stroke the maximum velocity occurs when the crank pin reaches 80° 30′ 17″ of the discharge stroke and area *FEC* is less than *DEC*. Therefore the greatest areas, *CBD* and *DEC*, overlap between 180° and 270°, and the smaller areas, like *ABD* and *FEC*, overlap between 0° and 90°. The overlapping areas between 90° and 180° and between 270° and 360° are equal.

Fig. 4 represents a triplex single-acting pump (three cranks, three plungers). This figure holds true for a triplex double-acting pump, or sextuplex. The area of the diagram, however, would be twice as great. There is nothing to be gained by six cylinders as far as evenness of flow and torque on the shaft are concerned, as the cranks would be 60° apart, giving the same number of pulsations. This can readily be seen by filling in additional curves from 60 to 240, 180 to 360 and 300 to 60, noting that all the ordinates have just twice the value.

Fig. 5 represents a quintuplex single-acting pump (five cranks, five plungers).

In these diagrams the ratio of crank-circle radius to connecting-rod length is 1 to 6, and the ordinates, computed for every three degrees, give accurate values. The types of pumps for which these ratios have been determined cover only the outside packed plunger variety.

For piston types the variations are somewhat greater, due to the effective area of the piston being less on the return stroke on account of the piston rod.

Air chambers and spring alleviators are sometimes employed to reduce the fluctuations in discharge and flywheels to compensate the variations in torque. The diagram shows the results of the different types without these appurtenances, which may be considered but means for partly alleviating a condition determined by design.

Air chambers are ineffective unless they are amply large and kept charged. This is practicable in low pressures with the use of a small air compressor for charging and keeping the air vessel filled with air. Spring alleviators are used in the higher pressures, and the amount of fluctuation taken care of depends on the number of coils employed.

Flywheels are not the usual practice except in some single-crank double-acting pumps. The manufacturers seem to rely on the moving parts of the pump to overcome the variations in torque. Actually only a small part of this variation is compensated for by this means. While this unsteadiness of action is not so serious on small units, it nevertheless affects the efficiency and life of the machine. On pumps of large capacity and horsepower the excessive variation in the discharge line and torque on the shaft is of great importance and should receive first consideration. It should be apparent that the smoother the action of the pump, the more efficient it is, and less subject to excessive wear.

Of all the pumps illustrated the quintuplex and triplex single-acting machines show the best results. The quintuplex has very little variation in discharge and torque. With but one more plunger than the duplex double-acting it is more than 6½ times smoother in action. The triplex, with one less plunger than the duplex double-acting, has only half the amount of fluctuation.

The triplex and quintuplex types have quite an additional advantage in being single-acting, in which all loads are made to act in one direction. This is not the case in the duplex double-acting, nor in triplex double-acting machines. In the former, two plungers are on the discharge stroke when moving in opposite directions. The plunger loads act oppositely through a total of 180° of crank movement. The triplex double-acting pump has always two plungers moving one way and the other in an opposite direction when discharging. Those actions, which produce abnormal stresses in the shaft, bearings, frames, etc., of double-acting pumps, are not met with in triplex and quintuplex single-acting machines.

Coal-Mining Conditions in St. Etienne

Conditions in the coal-mining industries of the St. Etienne district of France, says Consul William H. Hunt in *Commerce Reports*, during the first 7 months of 1914 were normal, the quantity and value of the production being nearly equal to that for the same period in 1913.

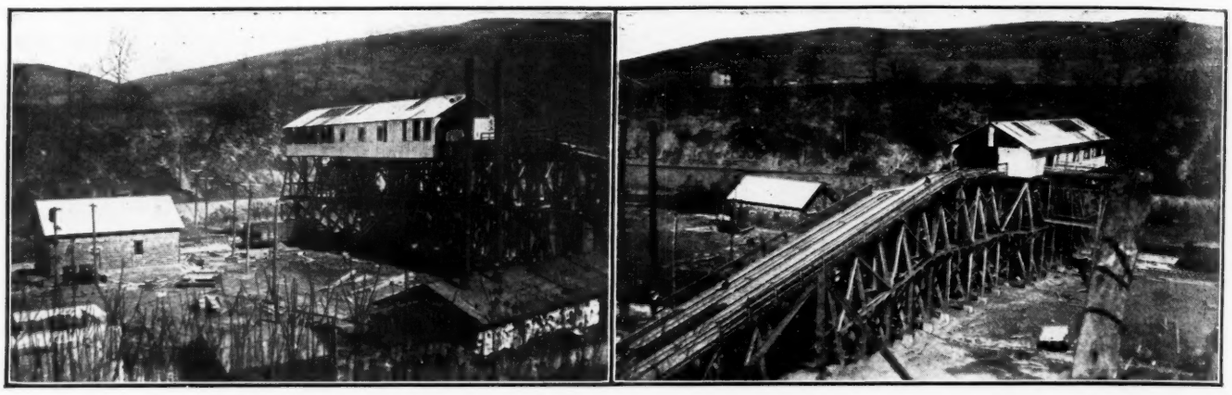
After the war began the military authorities granted all miners belonging to the territorial army a suspension from active military service, in order that the mines might not be shut down entirely by reason of the mobilization of the younger mine workers. The arrival, however, of a large number of Belgian and French miners, refugees, who formerly worked in the coal mines of Belgium and northern France, saved the situation; yet the output was far from normal. I am reliably informed that the quantity of coal produced in the Loire Basin from Aug. 1 to Dec. 31, 1914, shows a decrease of 50 per cent. in the output, compared with the statistics for the last five months of 1913.

The mining bureau of the Loire Department gives the total production of all kinds of coal in this region in 1914, in metric tons, as follows: Soft coal, 3,329,925; patent fuel (briquettes), 209,020; coke, 138,472; anthracite, 1012.

Application of Electric Power at the Soudan Mine

The Soudan mine of the Youghiogheny-Pittsburgh Coal Co., which recently began shipping coal, is one of the best-equipped mines in the country in which electrical power is employed.

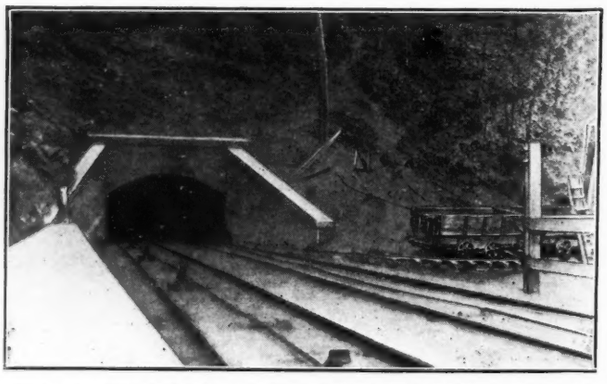
The elimination of the boiler and generating plants usually found around mines generating their own power adds greatly to the appearance of the surface layout of this operation. Located in Washington County, on the Ellsworth branch of the Pennsylvania R.R., this mine will develop a large acreage of Pittsburgh coal at a proposed daily output of 2500 tons.



TWO VIEWS OF MINE TIPPLE AND POWER HOUSE AT THE SOUDAN MINE

The coal is reached by a concrete-lined double-track slope about 500 ft. long on a 20-per cent. pitch. The manway and airway are constructed in a two-compartment concrete-lined shaft, rectangular in section and with an 8-in. reinforced partition wall between the stair and airway compartments.

Ventilation is secured by means of a 9 ft. by 8 ft. 10 in. American Blower Co. Sirocco fan, set in a brick and concrete housing entirely of fireproof construction. The fan is belt-driven by a 175/50-hp. three-phase 2200-volt motor, controlled from the powerhouse.



SLOPE AND PORTAL TO MINE SHOWING SAFETY DOGS EVERY 20 FT.

The powerhouse is 45x30 ft., of fireproof construction, being built of hollow tile. It contains the motor-generator set, switchboard and haulage engine; it is also the charging station for miners' lamps. The motor-generator set furnishes 250-volt direct current for inside work. West Penn power is used exclusively at this plant, all motors being built for 2300-volt three-phase alternating current.

With this system the engineer controls all of the machinery outside of the mine from the powerhouse. As an extra precaution the motor driving the haulage is equipped with a remote-control circuit-breaker, from which wires are run and connected with small knife switches on the tipple and elsewhere along the haul. In cases of emergency the rope may be readily stopped, without resorting to the bell signal, by merely opening one of these switches.

The system of hauling coal to the surface is the one best-suited to the local conditions. The equipment embraces 2700 ft. of 1¼-in. endless plow-steel rope, to which the cars are attached by means of cast-steel grips. The rope extends back into the mine 300 ft., at which point are located the tail sheave and tension carriage. Safety dogs are placed every 20 ft. on the uphaul to hold the cars in case the grips should slip. The rope is driven by a 150-hp. 2200-volt three-phase induction motor.

A Frame Tipple Is Employed

The tipple is built of heavy frame construction from native lumber and consists of 12x12-in. white oak bents substantially braced. This building is equipped with two crossover dumps of latest design, and also the most improved screens and weigh pans. The slate is readily disposed of by means of a spur extending from the side of the tipple.

There are four loading tracks with crossovers to facilitate shifting cars. Each is of sufficient length to hold 60 cars.

Inside the mine, development work is being rapidly pushed forward, a 7½-ft. short-wall undercutter and a 7-ft. breast machine being successfully used on entry work while locomotives are employed exclusively for gathering.

In accordance with the directions of the owners to provide comfortable homes for the employees in a sanitary location, the site of the town contiguous to this mine is one of the prettiest in the state. Double frame houses of 10 rooms, with 6-ft. cellar, as well as small 3-room cottages of neat design for the use of smaller families have been built.

Each family has a large plot for gardening and vegetable raising.

A water system furnishing pure spring water for household use has been installed, while adequate fire protection is now being projected.

Synchronous Motors for Coal-Mine Operations

By C. A. Tupper*

SYNOPSIS—The practice of employing synchronous motors for driving coal-mine equipment where the load is constant, or nearly so, is growing. This is because they tend to correct the disadvantageous low power factor that usually prevails in an underloaded alternating-current distribution system.

In the electrification of coal mines and surface plants, one of the most notable of recent tendencies has been the action of some of the larger operators in adopting synchronous motor drive for compressors, pumps, fans and other machines or lines of shafting which require considerable power and are operated continuously at constant speed. The object is to take advantage of the characteristics of the synchronous motor in equalizing the power factor of an alternating-current distribution system.

To understand the significance of this, it will be well to consider what "power factor" means.

When an alternating current and its electromotive force or voltage are in the same phase, that is, rise and fall in strength exactly together, the power in the circuit is the product of the volts and the amperes. But when the current lags behind the electromotive force, as when flowing to underloaded induction motors or transformers, or when it leads the electromotive force, as in flowing to a second generator, the power in the circuit is less than the product of the amperes and the volts. Whether the current lags or leads, the actual power obtainable from the circuit will be equal to a certain definite percentage of the power that the circuit would represent were the current and electromotive force in phase. This percentage, called the "power factor" of the circuit, is thus the ratio between the true power and the normal rated power of the generators.

Output Depends on the Power Factor

To illustrate: If a generator is designed to deliver 1000 kw. of energy at unity power factor—such rating; however, being usually given in kilovolt-amperes to indicate the absence of any deduction for loss in power factor—at 85 per cent. power factor it is good for only 850 kw.; at 80 per cent., no more than 800 kw., etc.

Taken by itself, an incandescent lamp load gives a power factor of 90 to 95 per cent. Fully loaded static transformers and induction motors running near full load, either separately or in combination with a lamp circuit, give high-power factors. Arc lamps yield a power factor varying from 70 to 80 per cent. at full load. Unloaded or lightly loaded transformers and motors of the induction type show, however, a low power factor on the average, seldom better than 70 per cent.

As the load is reduced, the power factor decreases rapidly. Lightly loaded transformers have an extremely low power factor.

Synchronous motors, however, will operate at any desired power factor, as this is dependent on their field current and is, therefore, under control. Varying the strength of the direct current exciting the field magnets, which can readily be done by an attendant while a machine is running, will cause any desired variation in the power factor.

In this manner it can not only be raised to any degree, but can be made to neutralize the effect on the entire system of other apparatus having a lower power factor, thus bringing the value in the transmission and distributing lines and on the generating plant, i.e., for the complete circuit, up to approximately 100 per cent., irrespective of other apparatus.

The synchronous motor can be constructed to operate on single phase or polyphase circuits, with, of course, the proper winding in each case. When its fields are fully excited, and it has been brought up to its rated speed, which can be done by a small induction or direct-current motor mounted on the same shaft, or by a special winding on the rotor, as explained farther on, current can be thrown on from the main supply as soon as synchronism is indicated by lamps or by a suitable instrument on the starting panel. Then, provided the speed of the main generating unit or units is properly regulated, this type of motor will run at constant speed from no load up to a very heavy overload.

The installation and care of alternating-current motors require considerably more attention for the synchronous than for the induction type; and anyone contemplating the use of the former, or who is not now getting satisfactory service from such machines already installed, will do well to consider these conditions.

In the first place, a synchronous motor should be installed in a dry room or chamber, where it will not be exposed to more than atmospheric moisture; it must also be protected from flying coal or other dust, from inflammable gases or combustible material. The location ought, also, to be cool and well ventilated, as any increase in the temperature of the room is added to that of the motor.

If the coils of the motor have been exposed to a low temperature before the machine is set up, their coverings should not be removed until they have had time to attain a temperature approximating that of the room. Otherwise, when opened, they will "sweat," with consequent unfavorable effect on the insulation.

Foundations Should Be Heavy

The foundation should be heavy enough to secure freedom from vibration, and in constructing it provision must be made for foundation bolts to hold the base or adjustable slide rails of the machine. Motors of, say 100 hp. and under, can be set on heavy timber supports; but a concrete or masonry foundation is to be recommended wherever possible.

Where a large synchronous motor is direct connected or the same shaft with the machine to be driven, as in the case of compressors of considerable capacity like those illustrated herewith, procedure resembles that of the installation of engine-driven generator units. The motor yoke usually rests on sole plates secured to the founda-

*Cleveland, Ohio.

tion. These sole plates, however, are frequently made in two parts, the lower one being bolted down while the upper is adjustable with shims to facilitate centering the stator with respect to the rotor. The smaller belted motors are usually shipped completely assembled, with the stator yoke and bearings fastened to the base or fitted with slide rails.

The best plan for handling the parts and putting them in position will depend largely upon the size of the motor, the location and the handling facilities available. If a crane spans the room the work is comparatively easy; but in the absence of this a horse or tripod made of heavy timbers should be provided, made sufficiently strong and well secured at the base to hoist the motor parts into place by means of a chain block.

After the machine has been carefully erected and all of the connections have been made and tested by the usual methods, both sets of windings should be dried out by slow operation; then it is ready to place in regular service, provided that the machine to be driven is in running order also.

Assuming that the synchronous machine has an auxiliary motor for starting, preferably of the induction type, the procedure will be as follows:

See that the switches on the supply circuit are open; and, if the current is taken through a step-down transformer, close the oil circuit breaker on the high-tension side of the latter; also, make connection to the source of excitation with the field rheostat all in, and insert the plug for the direct-current voltmeter. Then put in the synchronizing plug. Start the synchronous motor by closing the starting motor switch. Build up exciter voltage to normal, adjusting the exciter rheostat and gradually cutting out resistance from the field until the proper amount is reached.

Meanwhile, the auxiliary motor has been bringing the synchronous motor to slightly more than synchronous speed, as compared with the generator furnishing the supply; so the synchronous motor is slowed down to that speed by the closing of the switch controlling the synchronizing resistance. If the speed becomes too low, the latter switch is opened and closed again until the speed is right.

When the synchroscope or the lamps commonly used for this purpose indicate synchronism, current from the main supply circuit is thrown in and the starting motor and synchronizing resistance cut out. The field rheostat is then adjusted, as described in the early part of this article, so as to have the most favorable effect on the power factor. The apparatus to be driven is started up under friction load only when practicable, or by means of a belt shifter, tight and loose pulleys, friction clutch or barring device, as may be required.

Self-Starting Synchronous Motors Have Low Starting Torque

Self-starting synchronous motors, made in the smaller sizes, are provided with a cage winding on the rotating element similar to the rotor winding of the ordinary induction motor. This serves as an induction-motor secondary winding during starting.

A self-starting synchronous motor is usually designed to develop a maximum torque at starting equal to about 30 per cent. of that generated under normal running conditions and to pull into synchronism at approximately 15 per cent. of running torque. Consequently, this type of motor is only adaptable in cases where easy starting requirements prevail, such as driving direct-current generators, pumps that are started up with a bypass, short lines of unloaded shafting, etc.

The method of putting a self-starting synchronous motor in operation is similar to that used with a standard squirrel-cage induction motor; that is, by applying reduced alternating-current voltage directly to the armature winding. Ordinarily only one starting voltage—anywhere from one-quarter to one-half of normal—is required, and this is obtained through an auto-transformer with suitable tap. In applying the reduced voltage, an auto-starter switch serving as a combined starting and line switch is used.

Owing to the fact that during starting a dangerous voltage would be induced in the field winding if this circuit were left open, it is necessary to use a double-throw switch in order to close the field circuit through the field rheostat until operating conditions are obtained. This limits the current which would otherwise decrease the starting torque.

How to Start a Synchronous Motor

The details of starting are as follows: After first making sure that all switches are open, with all the rheostat resistance in, close the double-throw field switch above mentioned, and make the connection to the main supply circuit; then bring the auto-starter switch up to starting position. The motor should speed up to synchronism in a minute or less. When this has been accomplished, as indicated by the synchroscope or lamps used in its place, throw the field switch over with all rheostat resistance still in; then put the auto-starter switch over to running position, applying to the motor the full line voltage, and finally adjust the field rheostat for minimum armature current and the best effect on the power factor of the system.

Regulation of the exciter voltage will be as above described for a machine started by an auxiliary motor, the connection being made through the double-throw switch in the field circuit. If, however, the exciter is mounted directly on the shaft of the synchronous motor, the field discharge switch can be single-throw and the field connected directly through the exciter armature with the rheostat in the circuit. The field is thus short-circuited at standstill and is gradually charged as speed increases.

In general it may be said that the same care should be given a synchronous motor as an alternating-current generator of the same size and characteristics. And if this is done the service which it will render and the favorable effect which it will exert on the power factor of the system will well repay the attention given.

Explosives Should Be Handled with great care, and in this direction it may be useful to keep in mind the eight causes of accidents when shotfiring quoted by Professor Courtenay de Kalb: (1) A hole missing fire. Driving a well near the hole two days later has been known to explode the charge. (2) Using a short fuse to hasten explosion has exploded the charge before the workmen could retreat. (3) Smoking a pipe while charging a hole. (4) Loading a hole with the aid of an iron stemmer. (5) Firing a charge in a hole to clear it of water, and immediately reloading. (6) Ramming a charge in a hole with an iron crowbar; also tamping a charge with an iron bar. (7) Drilling out a misfire shot with a blunt drill. (8) Forcing a cartridge into too small a hole.

W. B. Owen's Reminiscences

W. B. Owen, of Dorranceton, near Scranton, Penn., who was formerly foreman of the Pettebone Colliery of the Delaware, Lackawanna & Western R.R. Co.'s coal department (now the D., L. & W. Coal Co.), recently wrote the following reminiscent letter to the Wilkes-Barre *Daily News*:

As the bell on the carpenter shop rang for work on the morning of June 1, 1859, I entered the primary department in Bellevue breaker to begin my education in the "Black Art." Sitting in my library today, in a reminiscent mood, with my diploma in my hand, my mind reverts to that momentous day when, with aching back and bleeding fingers, I arose from the stove-coal chute and with jubilant spirits betook myself home, for on that day of 10 hr. I had earned just 17c. For my first working month of 26 days I received the sum of $4.42. This rate of wages continued until Jan. 1, 1860, when for good deportment I was advanced to 28c. per day.

When 200 Tons Was a Big Day

The working day was divided into quarters. If the breaker started up and worked only 10 or 15 min. the men were paid for one quarter of a day. Full coal for the miners meant a full day for everybody. Two hundred cars of coal hoisted was considered a "big day."

Egg coal was used exclusively for generating steam. Everything under chestnut size was sent to the culm bank as refuse. It is safe to say that in those days some of the culm banks contained a greater percentage of coal than some of the veins now being worked.

The system of condemning coal for rock and slate was in an embryonic state. If a car of coal contained from 10 to 20 per cent. of rock (the quantity was always estimated) the top of the car was picked off and the consumer was allowed to clean the rest. The iniquities of the coal inspector had not yet been conceived. There were no modern "cost sheets" to give the poor bosses nights of wakefulness trying to frame explanations that do not always explain. This cost sheet of the coal-mining department is the greatest instrument ever devised by the company to keep down the cost of mining coal.

In those days lard oil, and later whale oil, was used for lighting purposes in the mines, and this was given gratis to the men and boys. There was no restriction on the use of timber and supplies, yet they were used with greater economy than today. The total production of coal from the company's mines in 1859 was 336,082 tons, which is less than one-fourth of the present annual output of the Woodward or Truesdale collieries alone.

Happy the Man Who Made a Dollar a Day

Following is the approximate rate of wages paid at that time: Hoisting engineers, $1 per day; firemen, 68c.; laborers, 50c.; slate-pickers, 17c. to 25c.; door boys, 25c.; single drivers, 48c.; team drivers, 62c.; driver bosses, $1.35. Yet the days of these low wages were days of peace, happiness and contentment.

There was only a slight increase in the wages paid until 1865, when the war closed and the demand for coal became so great that wages were increased from 50 to 100 per cent. Miners were paid $2 per car and got all the cars they could load. It was not unusual for miners to receive from $200 to $500 per month. Drivers who formerly received 65c. per day were raised to $2.20.

The news of this prosperity was carried to foreign shores and received an eager hearing from the hungering hordes of Europe, and they swarmed into the coal fields of Pennsylvania. When both the demand for coal and its price were reduced, wages were also lowered. Then the seed of discontent began to germinate; unions were formed and enmity sprang up in the hearts of the men. The days of unrest were begun, and they will never cease as long as coal is mined.

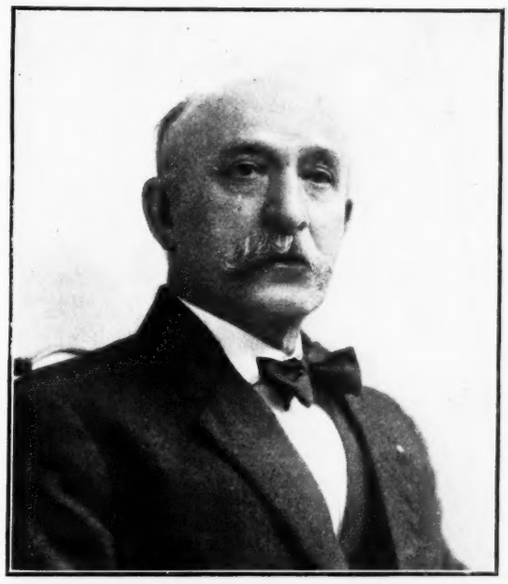
In 1872 the company was obliged to sue for relief in order to avoid failure. Employees in well-paid positions, such as engineers, conductors, officials, and in fact all the employees except miners and day laborers, were asked to submit to a reduction in wages, with the promise that when the stock again went up the wages would also be increased. The employees consented, but the agreement was never kept. If the same efforts to promote economy that are so strenuously urged today had been practiced at that time conditions would have been different.

With modern methods of mining the percentage of accidents, both fatal and nonfatal, is higher now than in those early days. Notwithstanding the laws enacted to protect men and boys and the safeguards thrown about employees and despite the keen competition among the companies to provide the greatest protection and the most efficient "first aid to the injured," the number of mine accidents is appalling.

Accidents Were Usually Charged to Carelessness

In the early days a fatal accident aroused universal sympathy; a collection was taken at the mines for the poor widow and the neighbors took care of her and the orphans. An appeal was seldom made to the company except for coal. And why? Because it was generally understood that the accident was the man's own fault. To what, then, can we attribute the enormous number of accidents of the present day?

With all the "safety first' signals and the warnings on every side, men and boys will rush headlong into danger with utter disregard for their personal safety. Liability and compensation acts are partly responsible for this condition. Men do not seem to hold their personal safety in such high regard as they did formerly.



W. B. OWEN

Fear of Heaven's displeasure kept men from danger then; now they do not even think of Heaven. In the early days men here, as in Wales, used to hold a prayer meeting at the foot of the shafts before entering their chambers. Today the prayerless man will enter his chamber disregarding all civil and moral laws, will deliberately return in mad haste to a delayed blast and will receive injuries. He will then establish a residence in an adjoining state, go before a jury that is ignorant of conditions in the mining districts, and will obtain a verdict of $50,000 or so. In the old days a gift of $50 and a scolding from his boss and the neighbors would be considered sufficient compensation.

After an unbroken service to the "D., L. and W. company" of 56 consecutive years, during which time I never received an injury or earned a cent from any other employer, and with boundless gratitude to Almighty God, I bid farewell to my "alma mater."

Seventeen Cents per Day and Upward

Mr. Owen's first day's work described in his reminiscences was performed when he was only 9 years old. He is now 65 and the company has pensioned him. He has been a slate-picker at 17c. per day, a driver boy at 28c., a driver at 42c., a team driver at 57c. He has bailed water and cleaned track for 70c. a day, run a plane for 87c., been outside barn boss at $1 per day, blacksmith at $1.35, and weighmaster at $1.64 per day. In 1875 he was made assistant foreman. As can be seen by his letter, he is remarkably well-educated for a man having such limited opportunities, his hobby being astronomy. It is not necessary to say that Mr. Owen has hosts of friends. His reminiscences are calculated to make every reader the friend of the genial Welshman.

Rebuilding an Unprofitable Mine

SYNOPSIS—A review of the conditions found in an unprofitable mine where the equipment was inefficient. The detailed steps that were employed in rebuilding the plant, and the results that were afterward obtained.

The mine here described is one owned and operated by a large company and has been in operation for about 20 years, but on account of the ambitious desire of several successive superintendents to make a record for themselves by producing coal at a low cost, the equipment not only had been neglected, but had not been increased by the management as the mine grew in size.

In the mine, the workings had become widely scattered. There were three divisions, any one of which if properly handled would have produced the required output of 1500 tons per day. The method of working was careless, and when one working place became bad, instead of timbering and making it safe, it was temporarily abandoned and another place substituted.

This in time caused the rib work to become very irregular, and as all rib work is more or less squeezed because of the weight, this lack of systematic mining caused the fracture line to be in such a condition that it was practically impossible to maintain a good system of ventilation. As there was more or less gas in the gob at times, mining work became hazardous, for it was quite impossible to remove the gas on account of the irregular fracture line.

By way of explanation, mining was on the room-and-pillar system. Rooms were 12 ft. by 300 ft., driven on the face of the coal off butt headings which were about 1200 ft. long. These rooms were driven sometimes 80 ft. centers and very frequently 40 ft. Often they were allowed to remain four or five months before the rib coal was extracted, and when this was done, instead of taking ribs out in uniform line, it often happened that four or five ribs were allowed to stand until they were as much as 150 ft. behind the fracture line. These workings were so extensive that they extended over a territory of about 4 sq.mi., so it was not unnatural that three sections out of fifteen were in a bad condition.

Economical Mining Was Impossible

The mining had been conducted in such a way that there was three times as much track as would have been required had the mine work been concentrated. The greater part of the rails in the track had been carelessly laid, there were not sufficient ties and frequently no splice bars, and nearly all the track was in a miserable condition.

The mine, on account of lack of thought on the part of the operators, had been allowed to grow in size and output without any corresponding increases in mine equipment. The chief reason for this policy was a matter of economy. The mine equipment in the way of cars and motors was little more than half what it should have been for economic operation. Thus men were not furnished as many cars as they could load. The poor condition of the cars caused the loss of coal and the sifting of dust on the track, causing much trouble.

Bad car axles and wheels as well as a bad practice of using sprags caused many wrecks, stopping empties as well as loads. There was not a sufficient number of motors to allow time for thorough and systematic repair work; consequently much time was lost in temporary emergency repairs. The grades were 4 and 5 per cent., and the use of sprags on only one side permitted the use of sand on only one rail; thus the motors were worked on one side. In keeping with the rest of the bad conditions, the drainage had been neglected and water on the haulage-roads caused the motor to slip and greatly reduced its capacity.

Surface Conditions Just as Bad

Outside of the mine, the machinery and equipment were in about the same condition. The shaft was wet, making it disagreeable for the men to travel on the cages. Also it was difficult to keep the hoisting ropes lubricated, and they had to be changed before they had been used more than one-third of the time they should serve under normal conditions.

The repair shop was divided into three sections or rooms. The windows were small and always dirty, and the electric lamps were not placed so as to give the men the necessary light.

The miners' houses were as poorly maintained as the mine. There were leaky roofs, bad floors, loose windows and many other undesirable conditions in the yards and streets. Such a state as was found everywhere caused much dissatisfaction among the employees and resulted in bringing in an inefficient, unruly class of miners. The foremen as well as the men were given to drinking.

The first important change made after the new superintendent went on the job was the gradual replacing of the foremen of the different branches of the organization with men who would think for themselves and who were total abstainers, for it was the opinion of the new superintendent that one who drinks in even a moderate degree is not a proper person to handle men in a hazardous occupation.

The next important step was to get the mine-car equipment repaired and increased to a point where it would handle the coal without delays and increase the production per man. Time was counted as money, and by eliminating the delays, the loss of coal and the wrecks, the efficiency of the men was increased about 30 per cent.

Work was begun on the haulage-roads immediately. They were relaid with heavier iron, and good ditches were made to prevent the flooding of the tracks. There was not an appropriation for a new motor, so the best had to be made of a bad job. The well-repaired cars, dry track and new rails all helped to relieve the strain and troubles of the motors. Each night the electric locomotives were taken to the shed and turned over to repairmen, who continued this work of rebuilding for six months, doing only such jobs each night as might be finished in time for the motors to be used in the morning. Thus little time was lost during the day in repairing the motors. Efficiency in two months was 25 per cent., and in six months, 50 per cent.

Mine work was concentrated, two sections being used, while the third was abandoned. The places which had been left idle on account of gas were carefully inspected and worked; the rib work was straightened, thereby simplifying the ventilation until in eight or nine months gas in any working place was an unknown thing. The cost of ventilation was reduced 50 per cent. in 10 months.

The Mine Was an Isolated One

The mine was located 1½ mi. from the interurban line and 5 mi. from the nearest city. As there was no conveyance from the car line to the coal camp, the miners were not as eager to select this village as a home as some other places nearer the city. Considering the condition of the entire plant before the reorganization, one can readily see that an undesirable class of miners predominated. After the mine had been put in a better working condition, the worst men were discharged as fast as better men could be found to take their places. As the more industrious men took the places of the hard drinkers, there was less laying off after paydays, and fewer miners took advantage of the numerous holidays in their church life.

The hoisting shaft was made dry by means of a water ring excavated in the strata back of the timbers and made water-tight by concrete. An iron pipe was used to convey the water to the bottom of the shaft. Thus the life of the hoisting rope was prolonged to at least three years.

The repair shop was cleared and remodeled, making one long workroom. The windows were made twice as wide and kept clean. Electric lights were put at places where they would give the best service.

The miner's houses were carefully inspected, and all necessary repairs were made as soon as possible. Porches were placed at the front and back of the houses, and the cellars were made dry. The yards were inclosed with fences, and miners were told to grow something green, if only weeds. People were encouraged to make gardens, and the number of hydrants was increased so that water-carrying was no great task. The streets were cleaned, and concrete drains were provided to carry away the water. Garbage cans were placed in the alleys and periodically emptied.

While only a few years ago this plant was considered one of the most expensive in operation, today it numbers among the cheapest in the cost of producing coal and has a reputation of being one of the best mines in the region in which it is located. It now has a force of strong bosses, some of whom are the best-paid men in the region.

New Zealand Government Mines

The government-operated coal mines of New Zealand, says *Commerce Reports,* produced 189,495 tons of coal during 1914 out of a total production of nearly 2,000,000 tons. This coal is placed on the market in competition with the privately mined and imported coals and is of a fair quality. The coal production of New Zealand has increased from 719,546 tons in 1894 to 1,888,005 tons for 1913.

Extracts from a Superintendent's Diary

A college mate of mine sent me a newspaper clipping today containing a poem describing the life of a miner as a poet imagined it must be. About every third line contained the word "dark," and the last line carried a desponding appeal for "light." It was more than an appeal, it was a prayer in which the miner begs that the horror of the dark may be relieved by a few stars.

The heavens are so full of stars, why couldn't just a few be spared to overcome the impenetrable inky blackness of the mines? What fascinating imagination! Surely, no one but a poet could have conceived that.

And my friend wasn't joking either; he was just as much in earnest as the poet was. He sent it to me as a literary gem. The receipt of the poem started a train of recollections. Ever since I entered the mining game I have received letters from friends wanting to know how human beings can accustom themselves to "impenetrable darkness." Yes, every last one of them has put in that word "impenetrable." Undoubtedly, some poet used the word in a poem that has traveled far and wide, although it has not been my good fortune to run across it; and the phrase was used so effectively that now the adjective "impenetrable" immediately suggests mines to them whenever they see it in print.

I am wondering what will happen to my correspondence when the same city friends read this other poem with the suggestion about the stars? If the bare mention of impenetrable darkness has made such an impression, what will the combination of stars and impenetrable darkness do to their imaginations and to my mail?

Last summer while in New York I made a special point of taking several of those friends around to hotel lobbies that depended entirely upon artificial light, and in addition to artificial light required large force fans to maintain artificial ventilation. I was very particular to pick out hotels where the ventilating problem had been given careful consideration, and in consequence were the most comfortable places to be found during the hottest hours of the day.

Being a stranger in the city, I was privileged to ask questions, and I always wound up by asking for information as to the effect of artificial light and ventilation on the death rate of hotel clerks. My hosts generally took a second look at me to see whether I was in earnest, and satisfying themselves on that score, they suggested that they were not familiar with the statistics, but if their business permitted they would be willing to take chances under similar surroundings.

That gave me my opportunity, and I never failed to rub it in good and strong. I contrasted the miner working in the quiet of his room, surrounded by cool fresh air and a single "buddie," with the laborer working in the well-lighted mill building, but with all of the din and confusion, to say nothing of the customary poor ventilation. If circumstances had permitted my giving all of my friends similar treatment, I am conceited enough to believe that every one of them who saw the paper with the poet's fancy about the stars in the impenetrable darkness would cut it out and mail it to me with some such remark written across it as: "What do you think of that for pure bunk?"

Illinois Miners' and Mechanics' Institutes Suspended

SPECIAL CORRESPONDENCE

The work of the Illinois Miners' and Mechanics' Institutes, for the coming two years, will be at a standstill. This is the result of Governor Dunne having vetoed the funds necessary for the work of the institutes at the last hour of the last day he occupied the office as the head of the State Government.

The House and Senate agreed on an increased appropriation of $31,600 for the coming two years, but the Governor's veto nullified their efforts. This act of the Governor in passing out of office has been generally regretted throughout the state. The common expression heard is that it is a great pity that the work is to be temporarily abandoned. All agree that the Illinois Miners' and Mechanics' Institutes, as an organization, was filling a great need in all industries.

The first center of instruction was established at Belleville on Mar. 18, 1914. From that time to Oct. 8, 12 other centers were established, in each of which a complete two-year mining course had been inaugurated. The average attendance at the different centers to Jan. 1, 1915, was 26 students. In that time 464 sessions had been held, and the work of establishing other centers had progressed rapidly.

The work of the institutes at the different centers, was ably assisted by the local school teachers, who gave their services free in teaching mathematics (in some places both elementary and advanced) and English for foreigners. This was notably the case at Collinsville, where C. H. Dorris, Superintendent of Education; A. E. Arendt, Principal of Collinsville Township High School, and the Misses Emma Harris and Melitta Harris, teachers in the Township High School, all gave their services free in teaching the above subjects. In addition to these, other teachers coöperating in the work of the institutes are the following: Kurt Busiek and H. G. Schmidt, Belleville; H. L. Kell, Benton; C. A. Chatten and R. G. Crisenberry, Carterville; W. H. Creed, Caseyville; George W. Solomon, Gillespie; Clarence Bonnell, Harrisburg; H. L. Heath, Ivan A. Palmer and T. H. Schutte, Herrin, and M. B. Coker, Troy.

On Apr. 6, 1914, less than seven weeks after the establishment of the first instruction center, a short six-weeks' course was given at the University of Illinois under the auspices of the institutes. This six weeks' course included the same subjects taught in the full two-year course. There were 33 students enrolled in this course, of whom four went through the entire course, while the others took special subjects. The same short course was held this year, June 6 to July 16, and 24 mine employees completed the whole six weeks of the course at the university.

In this connection, one has only to consider the scarcity of work at the mines during the past winter and the necessary expenses to each student for railroad fare and board, which may be roughly estimated at $50 for the six weeks, to understand that the Illinois Miners' and Mechanics' Institutes supplied a great need. If the work had been continued, it is probable that the short course for next year would have been divided into two or more classes held at the same time. It may be added that the men who attended the short course at the university were nearly all from centers where the two-year course was inaugurated.

It is to be deeply regretted that educational work of such a wide range and which was becoming firmly established throughout the state should be cut short by political intrigue. In every center there were found students who were exceedingly anxious to get an education. They were men who in their younger days had neglected the opportunities for education and others who since leaving school had let slip what they had learned. These all now realized the value of education in their daily work and were anxious to retrieve the time they had lost.

In the report for 1914, mention is made of the names of 58 men who attended every meeting of the institutes' courses in which they were enrolled. It is to be hoped that the enforced discontinuance of the regular work of the institutes will not discourage the teachers who volunteered their services so generously last winter and that much of the instruction work will be continued until the State of Illinois secures a governor who will be willing and able to befriend the miners and other industrial workers in their efforts to make themselves more proficient.

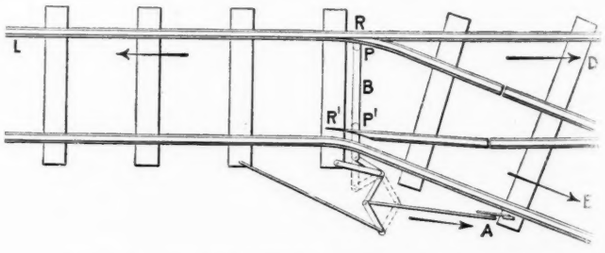
In closing permit me to say that it is a poor commentary on democratic rule and administration in the State of Illinois that the paltry sum of $31,600 appeared too large to be devoted to the work of instructing 80,000 miners in the state during the next two years. Such a proceeding surely manifests a penny-wise-and-pound-foolish system of economy. The miners of Illinois will certainly protest the action of their Governor, and two years hence will make their voice heard in the Legislature by the election of efficient state officers. In the meantime let us hope for greater enlightenment and a greater appreciation, on the part of the executive, of what is needed for the progress of the industrial workers throughout the state.

An Automatic Switch

BY W. G. BURROUGHS*

The automatic switch here described is being used successfully on the trestle to the tipple and at all motor passways inside and outside of the Black Diamond coal mine, Berne Township, Athens County, Ohio.

The automatic switch which is shown in the illustration is that used on the trestle to the tipple. In the figure, the switch is set so that the main track L up which the loaded cars come from the mine, is connected with the track E on which the empty cars stand after being dumped. The switch point P is in contact with the rail R, and the switch point P' is separated from the rail R'. The switch points P and P' are fastened to the steel bar



A SIMPLE AND PRACTICAL AUTOMATIC SWITCH

*Mt. Hope, N. Y.

B, which in turn connects with the system of levers as shown in the diagram.

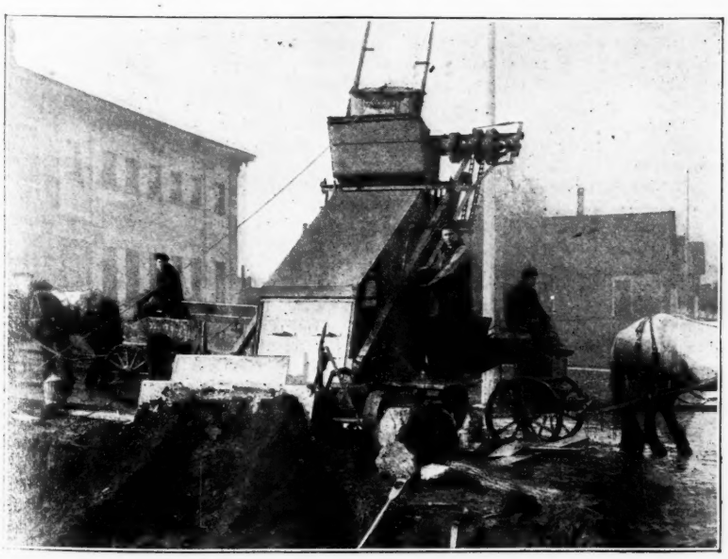
Each electric mine locomotive has a steel arm projecting on the right side near its forward end. The loaded trip coming from the mine nears the switch, which it will be remembered is set to connect the main track *L* with the empty track *E*. The man operating the locomotive uncouples the loaded cars from the locomotive just before reaching the switch points P and P'. The locomotive passes onto the sidetrack *E*, and just as its entire length is on this track, the steel arm on the locomotive's side strikes the lever arm A, which through the system of levers and the bar *B*, shown in the figure, throws the switch points. The switchpoint *P* moving away from the rail *R* and the switch point *P'* moving against rail *R'* thus connect the main track *L* with the track *D*, which leads to the dump on the tipple platform, allowing the loaded trip to proceed onto track *D* and to the dump. The switch points are now left connecting the tracks *L* and *D*.

The loaded cars are discharged on a crossover dump and by gravity are switched onto track *E* at the right and lower than the main track *LD*. Here the empty cars are coupled together, and the locomotive is attached. They then start back for the mine, moving along the track *E*. As the locomotive nears the switch points, its weight forces the latch back into its initial position, connecting tracks *b* and *L*. The locomotive and empty cars pass onto track *L* and proceed to the mine. The switch is left connecting tracks *L* and *E*, and ready for the operation to be repeated.

T. L. Smith Co. Buys Excavator and Loader Rights

The T. L. Smith Co. announces that it has purchased the exclusive manufacturing and selling rights of the Albrecht excavator and loader and is in a position to make prompt shipment of machines.

For over five years the inventor of this machine, John H. Albrecht, has tried to market his device. A number of machines were sold and are being successfully used in different parts of the United States. Lack of capital, however, prevented the successful development of the business. Realizing the immense field in which this machine could be used to advantage, the T. L. Smith Co. took over the entire business of the Albrecht Excavator Co.



THE ALBRECHT EXCAVATOR AND LOADER

The Albrecht excavator and loader is well described by a man prominent in engineering circles: "This machine is halfway between a hand shovel and a steam shovel and will do the work of both." Only two men are required to operate the equipment—one to handle the scraper and one to run the machine. A 12-hp. horizontal gas engine of the heavy-duty type provides ample power to dig and load 20 cu.yd. of material per hour. This device will dig at a distance of 100 ft. from the machine and at any desired depth for ordinary excavations at the rate of about one round trip per minute. This loader will load as fast as 10 men. It will dig at any point either above or below its level and over a big area.

The Albrecht excavator and loader can be used for excavating for heavy foundations, basements or drainage ditches, for back filling, for loading sand, gravel, coal or coke and other similar materials from a stockpile.

Additional data and information can be secured by writing to the T. L. Smith Co., 1110-A Thirty-Second St., Milwaukee, Wis.

Testing the Efficiency of Safety Catches on Cages

Among the many precautions taken to safeguard the lives of the anthracite mine workers of Pennsylvania is the testing at least once a month of the safety catches on the elevators, or mine cages, used in shafts. These tests are now a legal requirement, but they were originally instituted by the operators.

The test consists of dropping the cage, fully loaded with coal, to see that its safety catches are in working order and capable of preventing a fall in case the rope should part. For carrying out these "drop tests" a special release hook coupled to the end of the hoisting rope is provided. When the trigger of the release hook is pulled, the cage depends on nothing but the safety catches, but its fall is stopped within a few inches. The powerful catches act promptly and grip or bite into the guides tighter and tighter until the descent is stopped.

Naturally no men are allowed on the cage during the tests, but the loaded cage itself weighs about three tons, and this great weight is all exerted in making the safety catches grip the guides. The tests are always witnessed by responsible officials of the coal companies, and reports of the results are submitted to a state mine inspector.

Coal-Mine Ventilation

The Sept. 4 issue of *Coal Age* will be devoted to the subject of mine ventilation, and we earnestly invite all our readers to contribute articles for publication in this special issue. We particularly desire detailed descriptions of new mine-ventilating plants, and we will be pleased to publish the results of tests on fans or other ventilating equipment. Articles accepted and published are paid for at a liberal rate.

The Labor Situation

SYNOPSIS—The miners in Ohio are suffering from slow time, idle mines and strikes. Other work is being offered them in Cleveland, Ohio, and mining work in Pennsylvania and Kentucky. The railroads blame the miners for wanting an undue wage, and the miners blame the railroads for charging undue rates.

The poverty among the Ohio miners is increasing. The resumption of the Blaine mine of the Lorain Coal & Dock Co. on July 26 pending the installation of mine scales was more than balanced by the shutting down of the mines of the Sunday Creek Co., No. 266 at Hollister and No. 254 at Jacksonville. In the first of these mines 400 employees find work, and in the other two 500 and 300 respectively are laid off. Only one mine of the Sunday Creek Co., No. 268 at Rendville, is still in operation and now the Blaine mine is again on strike.

The citizens of Ohio are quite generally aroused and are giving liberally. Columbus, Cleveland, Cincinnati and Piqua have been extremely generous. Carloads of food are arriving at the mines and are being distributed by the National Guard.

On Aug. 4 work for 153 men from Glouster, Nelsonville and Chauncey in the Hocking Valley district was provided in various Cleveland, Ohio, plants. The men were brought by a special train to that city, being conducted by J. M. Roan, the "Ohio mining inspector," and lodged in the armory of the Fifth Regiment of the Ohio National Guard, receiving their supper and breakfast at the cost of the militia. In the morning they were conducted to their work by Boy Scouts.

Work Available in Parts of Western Pennsylvania, Kentucky and West Virginia

The Republic Iron & Steel Co. of Youngstown, Ohio, has offered to give work to 150 men in its mines in Pennsylvania and is paying the transportation of the men applying for this work. W. P. Lear, representing the Pond Creek Coal Co., of Stone, Ky., has also offered to give work to 100 miners who are out of employment. Apparently the men did not want to work in nonunion mines and refused to accept work at Stone.

Mr. Lear said his men averaged a little more than $3 per day and that 55c. was paid for room work and 60c. per ton for entry work. Every man can get all the cars he can load. The company was willing to pay the transportation charges of the men and their families. A meeting was held at Hollister, near Glouster, at which about 125 men were present. Some seemed inclined to accept the offer and doubted if the union was worth the sacrifices demanded, but these men were not in the majority and allowed themselves to be whipped into line.

A coal company in Fayette County, W. Va., has sent a call to the distributing branch of the United States immigration service, asking for 1000 miners and promising good wages and steady work. It has been suggested that the recruiting be done in Ohio. Obviously there is need, as often happens, for a redistribution of labor in the coal industry, though much of the trouble in Ohio is due to ill-regulated wage rates and railroad rates and only a part to the quality of the coal.

Much has been said about an unjust discrimination against Ohio coal. As a matter of fact, the fuel which Ohio produces is not as good as that from West Virginia, but that is no reason why it should not be used in Ohio to the exclusion of other coal, if wage scales were kept to a normal level and railroad rates were maintained on the same low ton-mile basis as in adjoining states where the transportation companies are faced with greater engineering difficulties in construction, maintenance and operation. Nor is it reasonable that coal outside Ohio should pass over the rails in that state at a lower mileage rate than Ohio coal. Little will be done by using stickers reading, "Buy Ohio Coal." The economic interest will and should always overcome mere sentiment.

However, it is apparently not true that the Ohio miners are starving, but it is certain that their conditions are severely straitened. During the past week bulletins have been posted in Athens, Nelsonville, Wellston and Jackson in the Hocking Valley district calling for 100 men to work on the Chesapeake & Ohio Ry. extension near Portsmouth, Ohio, for wages ranging from $1.65 to $2 per day. Yet the only man who reported for work was drunk when he applied.

A number of miners employed at the Blaine mine of the Lorain Coal & Dock Co. in Belmont County struck Aug. 7 for the second time in 30 days. The men demanded that the company allow them two checkweighmen, which was refused. By the terms of the settlement of the wage scale made about two months ago, when the 14-months' strike was brought to a close, the strikers will be compelled to pay a dollar a day each as a fine if the strike is contrary to the agreement. The contract provides that a strike cannot be called unless the operators fail to pay wages when due and cannot give a satisfactory explanation.

Coal Operators Will not Join with Railroads

The railroads have asked "that a commission of Ohio coal operators join with a committee of the railroads in that state in an informal conference with the Interstate Commerce Commission to secure, if possible, their consent to a general inquiry on their own initiative into the conditions in Ohio, West Virginia and Pennsylvania for the purpose of outlining the differentials to competing markets in the West, North and Northwest that should apply from the competitive fields of Ohio, West Virginia, Kentucky and Pennsylvania, such action to be without prejudice to any other action the Ohio coal operators may deem necessary to take."

The operators have rejected this proposal as the railroads do not admit in a preamble that any readjustment of rates is necessary nor do they disclose what would be their attitude before the Interstate Commerce Commission.

The railroads are evidently aroused by the labor situation, but the consensus among the officials is that to lower freights would only beggar the railroads without remedying the condition, for the roads in West Virginia would only make further cuts to meet the competition.

The Norfolk & Western R.R. sought consent to be dismissed from the case brought before the Ohio State Industrial Commission, declaring that it is its intention and desire to haul no Ohio coal, being able to secure all the traffic desired from the West Virginia field. It might have favored the Ohio people with this singular stand when asking for a charter in Ohio to acquire its right-of-way. Of course, the commission refused to dismiss the case against the railroad.

The railroads have been asked to act voluntarily and reduce rates to accord with the decision against the Hocking Valley Ry., but such reduction would not satisfy the miners and operators. The rates were then cut 15c. between Armitage and Toledo, the old rate being $1 per ton.

Hocking Valley Ry. Wants Complaint Dismissed

The Hocking Valley Ry. desired that the complaint against it be dismissed on the ground that it recently filed this rate in a new coal tariff. A few weeks ago the Supreme Court approved the reductions just mentioned, which were ordered four years ago by the Utilities Commission, and the Hocking Valley Ry. hurriedly filed these new rates so that it could plead that the company was entitled to keep them in force for a year from the date of filing. The miners' complaint predates the filing of this new tariff, and that introduces a complication. The Utilities Commission decided that the Hocking Valley should remain a party to the action for the time being at least.

Illness of witnesses and general lack of preparedness forced a delay in the investigation, and it will be resumed on Tuesday, Aug. 17. Practically only two witnesses were questioned—General Freight Agent H. Q. Wasson and General Manager M. S. Connors of the Hocking Valley Ry. Mr. Wasson testified that coal is carried from Armitage to Toledo for $1.25; of this the Toledo & Ohio Central Ry. gets 71c., the Hocking Valley Ry. 44c. and the companies owning the Ohio River bridges 10c. Coal is carried from the Kenova district to Cleveland for $1.02; 37.2c. of this goes to the Hocking Valley Ry. and 59.8c. to the Norfolk & Western Ry., and 5c. is charged for loading.

Attorney Harry Arnold, for the Sunday Creek Co., examined both witnesses. From General Manager Connors he sought to show the cost of transportation of coal on the interstate shipments and the amount of work caused in handling the domestic product of the Ohio mines. Later he will attack this showing as tending to prove that the rate on the Ohio product is far too high.

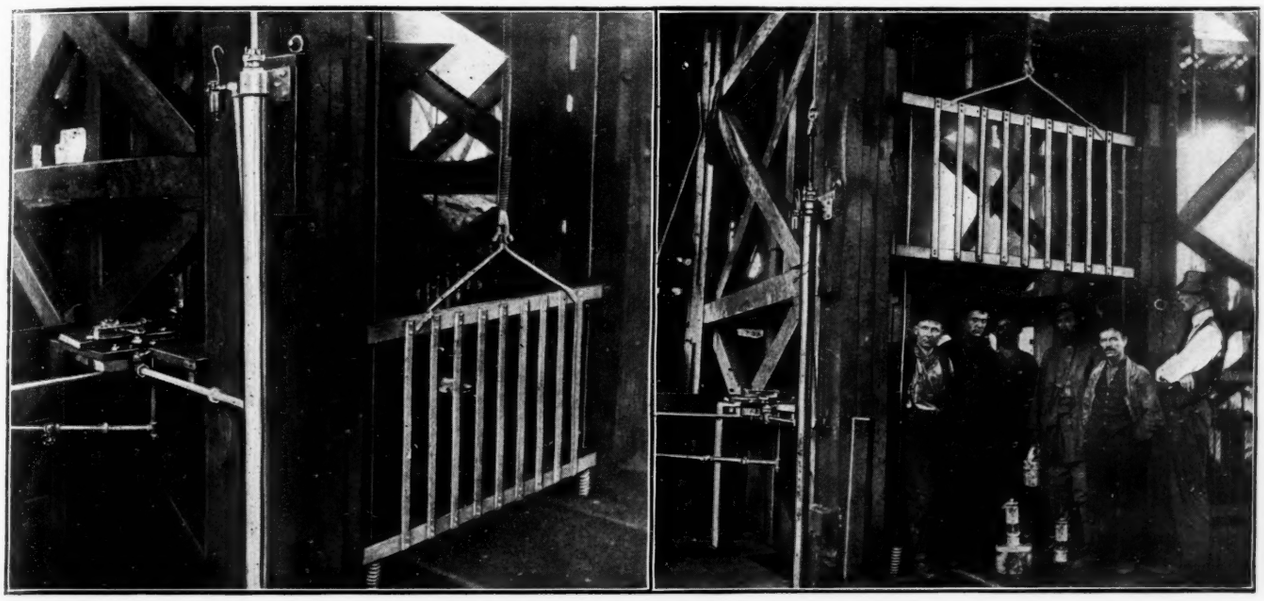
The fight thus far has been almost wholly between the Sunday Creek Co. and the Hocking Valley lines. That line of action was adopted because the Hocking handles most of the coal and its showing would make the most striking evidence.

The items relative to labor troubles in other states are of less interest than those in Ohio and will be reserved for publication in the next issue.

New Apparatus and Equipment

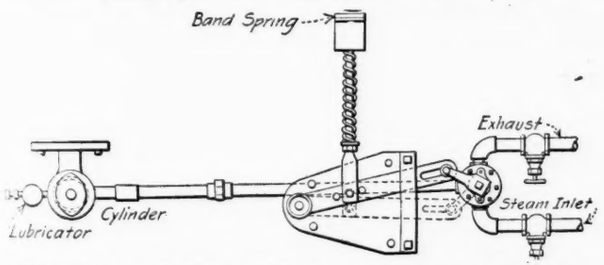
A Steam-Actuated Shaft Gate

The shaft gate shown in the accompanying drawings and illustrations has been designed by Thomas H. Tudor and Uriah M. Lenhard, two officials of the Pittsburgh-Westmoreland Coal Co. The gate shown in the photograph has been in operation for more than four months, with no expense for repairs or attendance since its installation, aside from the daily filling of the lubricator.



THE SHAFT GATE IN THE CLOSED AND OPEN POSITION

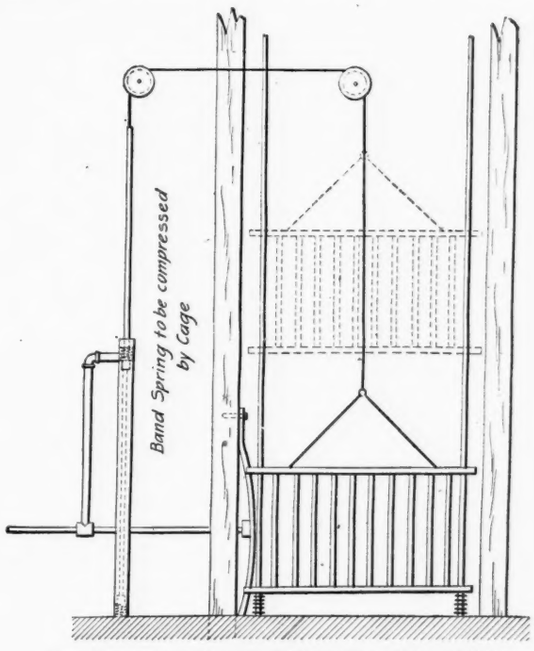
This gate is so arranged that the cage on coming to the landing throws the lever of the controlling valve, admitting steam or compressed air to the cylinder. This forces the piston down, lifting the gate through the medium of a cable passed over suitable guide pulleys. Suitable springs placed in the cylinder above and below the piston prevent it from striking the lower head when the gate is being hoisted or the upper head when the steam is exhausted.



THE VALVE MECHANISM CONTROLLING THE GATE

When the cage is raised or lowered from its normal position at the landing, the lever of the control valve is thrown in an opposite direction and the steam or air exhausts from the cylinder, allowing the gate to return to its normal position.

The time required to raise the gate or to allow it to settle to its normal position may be controlled by the action of two valves, one in the steam supply and the other in the exhaust pipe. These are adjusted until the desired time of raising and lowering has been secured, when they are allowed to remain in this position and by their throttling effect govern the speed of travel of the piston in the cylinder and the gate to which the piston is attached.



ARRANGEMENT OF CYLINDER AND GATE

This device is simple in construction and not liable to get out of order. It has received the approval of Alexander McCanch, mine inspector of the first bituminous district of Pennsylvania. It fully meets the requirements of the Bituminous Mining Law, as embodied in section 1, article 8.

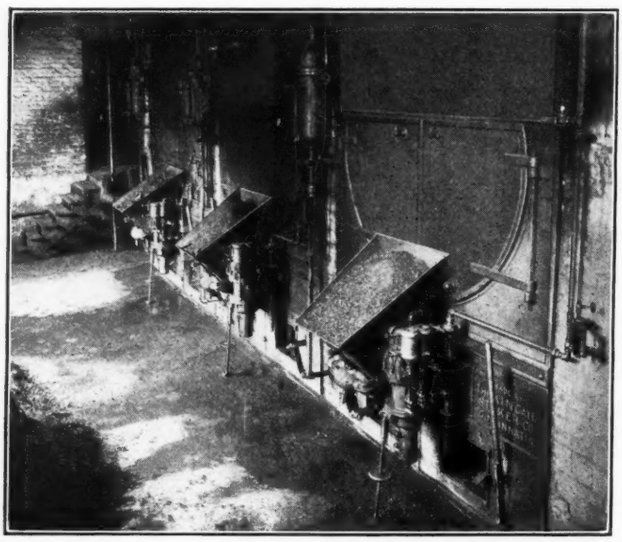
The device is so constructed that if the cage is raised or lowered 12 in. from the landing position the gate immediately closes. This renders it practically impossible for an accident to occur at the ground landing.

The fact that the gate rises vertically instead of swinging horizontally is a great saving of time and space. With this device it is unnecessary to crowd the miners back from the cage entrance in order to open the gate or again when the gate is to be closed. As the device acts promptly and positively upon the arrival or departure of the cage, it saves considerable time, both of the cager and of the miners being hoisted or lowered.

The Kincaid Stoker

A type of stoker operating on the principle of spreading has been placed on the market by the Kincaid Stoker Co., 507 East Pearl St., Cincinnati, Ohio. This device may be used with equal facility on either externally or internally fired boilers—any type which may be hand-fired.

One of the secrets of successful hand stoking is the firing of small charges of coal at frequent intervals. The fire is thus not deadened by large quantities of green fuel,



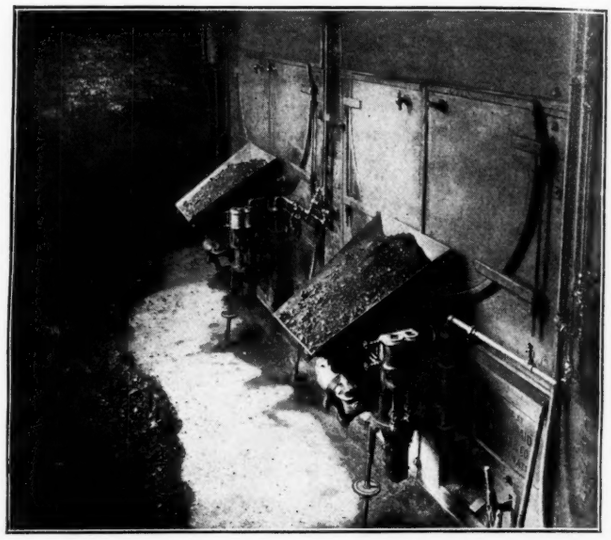
KINCAID STOKERS INSTALLED FOR BORDERLAND COAL CO., ARMEN, W. VA.

and the gases distilled are largely heated and burned and are not permitted to pass off as dense black smoke.

The Kincaid stoker employs ordinary stationary or rocking grates, and the fuel, once deposited on the fire, is not moved until it is disposed of as ash. Draft doors, dampers, etc., are handled precisely as with hand-fired boilers. The only change in the boiler setting necessary in the installation of this stoker is the substitution of a special lower boiler-front plate while the door jamb and arch are splayed or flared in. The entire stoker mechanism is mounted on the boiler front in place of the ordinary fire door.

A steam-driven ram pushes, or rather "kicks," successive charges of coal over the distributor plate, which spreads the charge in the furnace. Exhaust from this ram is made through a rectangular slot. The exhaust is so timed as to take place at the instant the charge of fuel is leaving the plate. The material is thus given a further kick by the steam.

The distributing plunger operates in a cycle of four strokes of varying feeds or intensities. The first or hard-



KINCAID STOKERS INSTALLED AT BORDERLAND, W. VA.

est stroke delivers coal to the rearmost quarter of the grate surface, the next over the next adjacent quarter, the third stroke over the next quarter, and the fourth or lightest stroke over the front quarter of the grate. The next stroke of the plunger, of course, starts a new cycle.

The entire stoker mechanism, including the feed hopper, may be swung clear of the furnace opening to permit of cleaning or repair. A pair of crushing rolls in the bottom of the hopper reduces the coal from 8-in. lump and smaller to a size suitable to be spread over the fire. Mine-run coal may be fired if it does not contain too large lumps.

Fluctuations in Boiler Demand

Fluctuations in the demand on the boiler are accommodated by varying the number of charges of coal through a range of from 10 to 75 charges per minute. This variation is accomplished by regulating the number of strokes of the engine within a given length of time, and independently of the velocity of the piston, which remains constant in the cycle before referred to. The coal is spread evenly over the entire grate, building up a light, spongy fire, through which air passes readily and without difficulty. Since the coal is scattered evenly and in small amounts, the volatile gases are distilled at a practically uniform rate, which permits a perfect combination of these gases with the air. The result is that the gases distilled burn before they have a chance to become chilled by the boiler surface, and the furnace efficiency is consequently high.

This stoker requires no more headroom within the fire-box than is needed for hand firing, nor does it require more space outside of the boiler than is taken up by the fireman. A space of 30x60 in. is required to swing the

stoker around, while when in its operating position it takes up only 30x35 in.

The Kincaid stoker does not require expert manipulation. Inexperienced men have been taught to handle this machine in the course of one hour's time, maintaining a maximum and uniform steam pressure with ease. The work of handling the stoker is much less arduous than hand firing, and as the fire never needs hooking or slicing, the fireman is not exposed to the radiant heat from the open furnace door. Where mechanical means for handling coal are not provided, the low feed hopper is a decided advantage, as it is not difficult to fill this hopper with a shovel from the boiler-room floor.

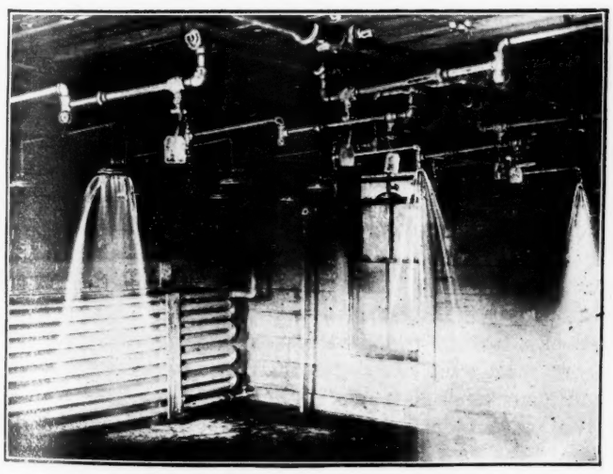
The illustrations accompanying this article show two installations of Kincaid stokers for the Borderland Coal Co.—one at Armen and the other at Borderland, W. Va.

The Circle Shower

The efficient heating of water through the medium of steam is a problem which has been effectively solved by the "Circle water heater, or shower."

This heater is extremely simple. It comprises a globe having a vertical stem and a lateral outlet. A steam nozzle enters the vertical stem and discharges, downward against the bottom of the globe. The steam is thus caused to pass through the lateral outlet with a whirling motion. The water inlet is connected with the side of the stem, and the action of the steam as it is condensed by contact with the water produces a suction that draws the water inward, and thus aids any head it may have. The incoming water and steam are thoroughly mixed, and the water is heated.

In the operation of the apparatus, the valve in the steam line is first opened, the condensation is allowed to discharge, and the valve is closed. The valve on the water line is then opened until the required flow of water is secured through the lateral outlet of the globe, after which the steam is gradually turned on until the water is heated to the desired temperature, which will not vary to any extent with a given setting of the valves.



THE CIRCLE SHOWER IN THE BATH HOUSE.

This device was specially designed by Everett C. Circle, of Coalton, Okla., chief engineer of the power plant of the Oklahoma Consolidated Coal Co., for shower baths, where an even temperature is necessary. It is substantially built, and it operates positively for years without repairs, trouble or adjustment.

The illustration shows a corner of the bath-house at No. 3 mine, where the showers were given their first trial. On the left is shown the type formerly used, which were installed so that all showers were heated to the same temperature, regardless of the individuals' desires. Frequent renewal of some of the working parts was also necessary. Actual tests show the Circle shower uses about one third of the amount of water used in the old type and with more effective results.

To the right of the center is shown the evenly distributed flow from the Circle shower, and in the extreme right is shown a Circle shower with the condensed steam being blown out, which is the first step in the operation.

The Circle shower operates successfully in a variety of ways. It can be used with hot water, instead of steam. It may also be used in connection with an ordinary bath-tub or shower cabinet. In short, it is so serviceable and simple that it can easily be placed, with gratifying results, in any convenient part of a home or shop, where the necessary connections can be secured.

After a thorough test of the Circle showers, they are being installed in all the bath-houses of the Oklahoma Consolidated Coal Co. and are being adopted throughout the Henryetta field generally.

Recent Legal Decisions

Right to Rescind Contract of Purchase—A coal-mining company, by retaining a purchased air compressor for two years, waived any right to rescind the purchase on the ground that the machinery did not possess the capacity it was guaranteed by the seller to have. Right to rescind a purchase is lost unless exercised within a reasonable time after discovering the breach of contract relied upon as ground for rescission. (Kentucky Court of Appeals, Meek Coal Co. vs. George D. Whitcomb Co., 176 Southwestern Reporter, 354.)

Validity and Breach of Fuel Sales Agency Contract—A contract whereby a fuel company agreed to give a firm of brokers the exclusive sale of the company's coke output on commission was not invalid for want of mutuality, although it provided that the agency should continue as long as the firm's services should prove to be satisfactory and bound the company not to quote prices to anyone else, the agreement binding the firm to keep the company supplied with orders and to collect and guarantee all accounts for coke sold. But the contract, being indefinite as to duration, was terminable by either party on giving notice to the other. The act of the company, however, in quoting prices direct to buyers cannot be deemed to be an election to revoke the contract; it will be treated as a breach of the contract entitling the firm to recover damages therefor. (Kentucky Court of Appeals, Elkhorn Consolidated Coal & Coke Co. vs. Eaton, Rhodes & Co., 173 Southwestern Reporter 798.)

Coal Docks Not a Nuisance—A railroad, some time after the grant of a right of way from the United States in the city of Missoula, Mont., constructed thereon a coal dock. Residents in the neighborhood, who had received title to their property after such grant, sued the road for maintaining a nuisance, alleging that coal dust from the dock penetrated into their houses, etc. They did not allege that the dock was improperly equipped or operated. The Supreme Court of Montana held that the railroad was not liable, since the grant carried with it the right to maintain all kinds of property and do all sorts of acts necessary in constructing and operating the road, the term "railroad" fairly including all structures necessary to its operation. While cases involving coal docks are rare, the authorities are agreed that, when the grant of a right of way is made to a railroad without restrictions, it contemplates not merely the railroad as it is established in the first instance, but the road with its necessary apppurtenances as it may from time to time come necessarily to be. (Smith vs. Northern Pacific, 148 Pac., 393.)

Editorials

The Rawness of the Union

A foreigner some twenty-five or thirty years ago remarked, "I cahnt understand what you despise in a mugwump. He seems to me a pretty decent sort of a chap instead of a cad and a bounder." But then he had not lived through the period of conflict, and so his American friends did not argue with him but smiled at him in a superior way or laughed at his simplicity.

They themselves probably did not know why party gripped them in such unbreakable bonds. For few of them realized how their reasoning was colored by the past or perceived that they discussed politics with their hearts rather than with their brains. Most of the Northerners believed that they made a sorry return for the sacrifices of their fathers when they voted the Democratic ticket, and most of the Southerners felt they were untrue to their kith and kin and color when they voted for a Republican. Thus mugwumpery was an offense.

Since then the very name has died. Mugwumpery had no martyrs, of course, but nevertheless it spread and lived as a practice while dying as a creed. But before it became common any "yaller dorg" could run for office if he got his party nomination and could get the party votes. "Yaller dorgs" was what they termed them, for it was a period when strong language was common.

This was the rawness or soreness of the American Union after its phenomenal conflict, for you cannot have a struggle without some sore heads and unhealed "anatomies." And very like to it is the soreness of the labor unions and of the United Mine Workers of America.

The miners' union has gone through its conflict and all those who belong to the union have that uncomfortable feeling of strife which we all felt when the struggle ended at Appommatox. But as the one soreness has worn away so will surely the other.

The guilds in Great Britain, when fighting became no longer necessary for existence, developed into the most peaceful organizations, promoting benevolences, protecting the weak, educating the young, inspecting the products of their members, constructing stately buildings, regulating the customs of the industry and performing patriotic services. And the union, we trust, freed from the stress of conflict, will also lose its rawness, will gather to its councils constructive, sober-minded, conservative labor men and will serve alike the industry and the state. Most of the organizations of mankind, given time, tend toward benevolence and social helpfulness.

But for this we must wait and have patience. Without conceding anything which should not be conceded we should look hopefully forward to a newer condition. If the leaders of thrift, morality and prudence continue as of late to gain ascendency in the union, that organization may conceivably be more generously fruitful than it has ever been destructive.

Among the hopeful things we can say about the United Mine Workers of America is that it has rarely been a grafting concern and sold immunity from strikes for money like the unions in the building trades. It has made almost no one rich. Its worst feature is its unrelenting hostility, its brutal treatment of mugwumps—whether they be moderates in the union or independents without; its animosity to corporations—be they unconscientious or philanthropic; its tendency to be always fighting. These are its rawnesses which are the outcome of its past; but history suggests despite its contradictions that the cause of the blister being removed, it will not be long in healing.

Progress in Mechanical Mining

History is not so much a chronicle of events as a record of the way in which those events impressed themselves on the people who wrote the history at a time roughly a decade after the events happened. As the philosophers would phrase it, history is subjective rather than objective. It represents not what people did so much as what they thought they were doing or had done.

If we pick up one of our national histories and try to trace the record of our mechanical development we find that the American intelligence rose to a great height in the middle of the last century and then mysteriously slumped away, till now there are no inventive geniuses left.

Every child learns about Elias Howe, the improver of the sewing machine in 1846, of C. H. McCormick, who invented the reaper in 1831, and of S. F. Morse, who in 1837 made telegraphy a success. Amasa Goodyear's improvements in rubber manufacture in 1844 and Cyrus W. Field's submarine cable in 1854 are all friends of our childhood days. So even is Dr. J. W. Draper for his work in establishing the art of photography. All these men get generous credit; sometimes some of them perhaps get a trifle too much, for it is hard sometimes to differentiate improvers from original inventors.

But while "there were giants in those days" history records little about others who have lived since—and yet, you say that there are others and that never was American invention so marvelous as today. Why then does the school history overlook these advances and tell us solely about statesmen and soldiers in the sixties and about politicians and statesmen thereafter? For this reason: History does not relate facts—only our attitude toward them.

As a result, inventive genius receives no honor, nor does it often receive even an appropriate pecuniary reward. The man who first schemes out a revolutionary improvement rarely makes money. The firm that exploits the invention does that. The inventor is entirely forgotten. The mining profession is just like any other. The new developments are unconnected with any names except those of the companies that purchase the patents and make the articles for the trade.

And even then it is considered the right thing to put on the soft pedal when we record the achievements of the

new machines, as if the duty of the editor was to "damn with faint praise" every meritorious discovery. The reader also, trained to condemn the appearance of commendation of something sold for profit, is anxious to see that everything in a technical paper shall refer to subjects from which no one can earn a dividend. This animus has kept alive a lot of more or less fossil mining subjects. The publishing of them cannot possibly enrich anyone; therefore they are fit matters for publication.

We are only a few steps removed from the superstitions of the past. We are still in our hearts the victims of caste. Geology is a study from which a man can hardly make a living. It is unpatented, unpatentable, unsaleable—so it is a worthy study, almost on a par with astronomy and philosophy. It is the caste study of coal mining, but it won't cut coal. It is the dullest, slowest tool that the coal-mining journals exploit. It hardly makes in any way for efficiency; and so, being so cleanly immaterial, it is the very dean of mining—respected and venerable, but hardly able to support itself unaided.

To illustrate the unfortunate attitude which is growing on us, Secretary Lane's "Invocation to the Flag" might be introduced. Written as a general manager's note to his many employees, it is a splendid and stirring appeal to patriotism and loyalty and might well find imitation in "house organs" published for the benefit of employees. It certainly is a tribute to the altruism which is the glory of our civilization.

But the invocation is about to be placed in the schools, and it will there serve mainly to inculcate the idea that the Stars and Stripes represent nothing else than the people who wear the governmental dog collar—and muzzle. It may well be admitted that some of those in the government service are splendid idealists. But so also is the man on the street, the inventor, the lower-caste person who does not hold a government job. Does not the flag also represent him?

In fact, when read to the general public, for whom it was never intended, the invocation is only one mite less bad than that other unfortunate utterance of the Secretary of the Interior published in *Coal Age* on page 634 of Vol. 7. It appears that this created so much animadversion that its very publication in our columns, even with reprobation, has been regarded by some as an offense.

It had precisely the same fault as the "Invocation to the Flag," in that it magnified overmuch the work of the federal civil service. The public is being trained to believe that the only service worth while is the federal and looks with suspicion on all improvements and advances made by individuals. The chief work of government bureaus is to control industry rather than to lead it, and it is really surprising to note that the public admires the bridle rather than the horse which wears it.

A little generous recognition of the inventors of industry would do much to make a too often unprofitable occupation at least honorable and worthy of our aspirations. It would be well to suggest that our readers cast over in their minds the names of the inventors of improvements and developments of mining machines and equipment. In most cases they are hidden in complete obscurity. No seven cities are competing for the honor of their birth.

The socialist tells us that the great improvement in the building up of the world is the more equitable distribution of the receipts of capital, despite the fact that this distribution has changed but little in centuries and will probably never be perceptibly different to what now obtains, no matter whether the capitalist is a man, a municipality or a state.

The great change has been wrought by the inventor. Give the man who believes that the great advances have resulted from political activity a choice of being bounced along slowly in a box known as a sedan chair, like a rich man of a century or so ago, or of traveling in a seat on a railroad train comfortably and at express speed, and we know what his choice will be. The comfort of the workingman has not come from your politician or statesman, but from invention; yet our school histories, our magazines and even our technical journals are disposed to forget that we have any inventors.

As the Miners' Union Develops

One cannot avoid seeing hopeful signs in the labor movement, no matter how little of an idealist one may be. The miners are not without a constructive program, though it must be confessed that they and the operators, and the press of both, lay too much stress on the purely destructive and aggressive attitude within the industry.

The constructive interest shown in Illinois and Indiana in favor of a restricted competition, the desire to protect the operators in Illinois against the unfair practices of cooperative societies, which only pretend to pay the union wages, the fight in Ohio for fairer freight rates so that capital can receive a price for coal permitting the payment of the present schedule of wages, the coöperation in Wyoming, Illinois, Texas, Oklahoma, Kansas, Iowa, Missouri and Arkansas in securing mine safety and first aid, and the recent stand for the settlement of the quadrennial or biennial disputes without strikes are one and all signs of a worthy spirit.

They show that labor in coal mining realizes that there is a greater solidarity than merely that of labor. No solidarity is safe but that which concerns the whole industry. If the miner should burn down all the coal works, he would find himself farther from prosperity than he is today. He can easily cripple his employer by unreasonable action, but he will find, as he has recently in Ohio, that though the mine owner grumbles loudly at the heavy hand of the miner, that hand has after all been most greivously laid on the person and property of the miner himself.

Slowly a larger solidarity is being learned, and it is interesting to note that John P. White, the president of the United Mine Workers, rarely forgets it and always seeks, though sometimes vainly, the way of peace. Of course, when he demands too much a struggle must come, but he never deliberately seeks such an issue for the sake of showing his strength or gratifying his pugnacity.

If a glance at his straightforward countenance is not enough to assure one of his unquestionable honesty, his recent utterance is sufficiently convincing: "I have every reason to feel assured that the operators, like the miners, want to be fair. The public should not become alarmed at the stories of a strike nature, for the mission of the United Mine Workers is one of peace."

This statement is extremely conciliatory and shows that Mr. White appreciates the good purposes of the operators far better than some of those city journalists who exhibit themselves as the miners' friends and would increase their wages without paying any part of the bill.

Sociological Department

Replacing the Saloon in Mining Communities

By Charles R. Towson*

SYNOPSIS—The saloon breaks up the monotony of the life in mining villages, and to compete with it or to replace it, it is necessary to find a force of equal or greater social value. Such a place must be more than a house; it must be in a sense a home and have someone who will sustain and control its activities.

A coal operator who is also a philosopher said recently, "The saloons in our state will be closed in a few months, and we are glad of it, but we must have a substitute." The saloon must go. It has shown itself to be incapable of improvement. Long ago religious reform spoke the word; education has explained it, and now their great economic ally, business, will enforce it. But with all its destructiveness, the saloon furnished a center and rendered a service needed in every community.

The very nature of men calls for a place to meet, to talk and to be friendly in a democratic way. The saloon has always furnished more than drink. It has been a social center. The clink of the glasses is a social and a natural speech. The saloon with the drink must go, but the social impulse, the desire for comradeship, for the clink of the glasses, will remain.

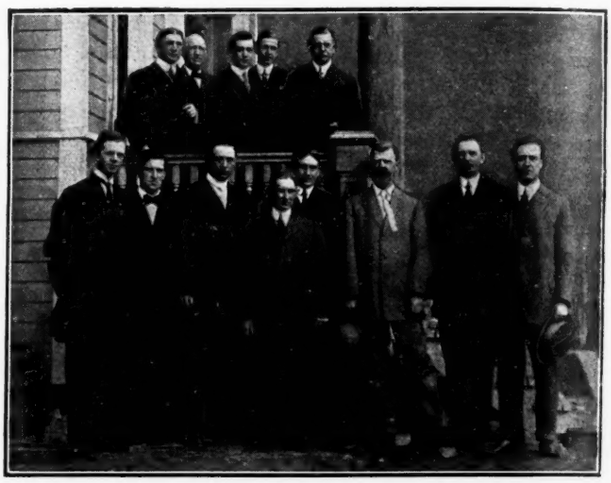
DECOTA, OF THE CARBON COAL CO., KANAWHA COUNTY, WEST VIRGINIA

The first mining village in West Virginia at which a Y. M. C. A. was established

What substitute for the saloon is available? Those communities will be wisest that most quickly establish as a substitute for the saloon, a place of friendliness and cheer—a place where relaxation and recreation may be had without the destructive influence of the saloon. If this can also be made a place of constructive value, for physical, moral and mental improvement, so much the better.

Contentment Is Better than Diplomacy

Mining communities afford little chance for the right use of idle time; yet there are few places where there is more of such time available. Monotonous work is bad, but the monotony of idleness is worse. Both are enemies to happiness and efficiency. It is strange how little thought or money is put into changing leisure time from a liability to an asset in such communities. Some employers are finding ways to improve the leisure life of the workers and their families, but more have ignored the need.



VISITORS AND OFFICIALS AT OPENING OF BENHAM, KY., Y. M. C. A.

From left to right, standing on ground—White L. Moss, then vice-president and general manager, Continental Coal Corporation, recently resigned; Tom Booze, local secretary Y. M. C. A.; H. H. Asher; J. C. Acheson, chairman of Kentucky State Committee, Y. M. C. A.; Philo C. Dix, state secretary of Y. M. C. A. in Kentucky; W. C. Tucker, superintendent, Wisconsin Steel Co., Inc.; C. R. Towson, secretary of the International Y. M. C. A. at New York City; C. J. Hickes, welfare man for the International Harvester Co. From left to right, on the porch—H. F. Perkins, president of the Wisconsin Steel Co., Inc.; Dr. A. Gatliff, of the Southern Mining Co.; a representative of the Louisville Courier-Journal; G. A. Ranney and Cyrus H. McCormick, general manager and president respectively of the International Harvester Co.

Many workers move from place to place for no other cause than sheer monotony. Others move because they have so little to anchor them. One operator realizing this purchased a large number of parlor organs and sold them among his people, not because they could play, but to make moving more difficult. Miners and their families have been known to walk miles to reach a village where a musical fakir entertained on the street. No means had been offered in their own village for satisfying the legitimate desire for entertainment.

The groups hanging around the stations, stores and corners in our coal-mining villages are witnesses to the fact that industry has not considered the human needs as scientifically as it has those of its machinery, markets and finances. It is a fact that we are experts on machine efficiency, but novices in developing man efficiency; and this in face of the fact that the greatest asset unrealized as yet in coal mining is not the resources of the mine, but of the miners. Leisure time can be used to help men grow in knowledge, energy, loyalty and contentment, but to use this leisure successfully leadership is needed.

*Secretary, industrial department, International Committee of Young Men's Christian Associations, 124 East 28th St., New York City.

EXTERIOR AND INTERIOR VIEWS OF Y. M. C. A. OF THE McALPIN COAL CO. AT McALPIN, RALEIGH COUNTY, W. VA.

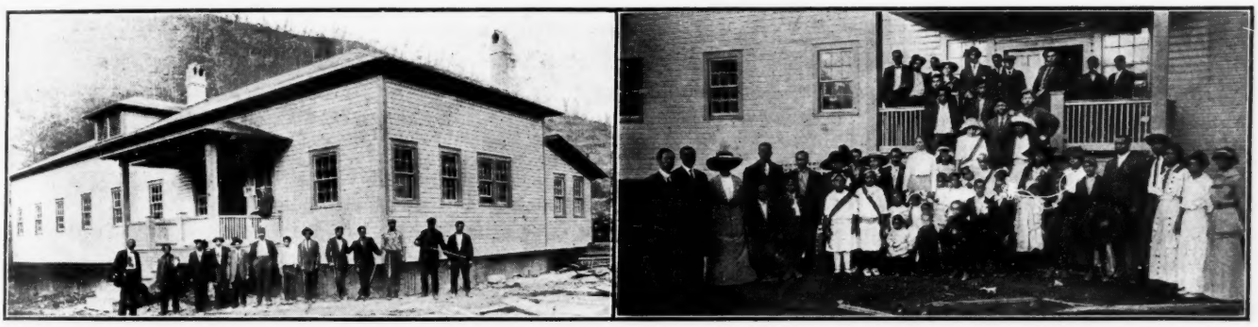
The saloon has furnished a place of meeting and something of social intercourse, but its influence is not in the right direction. The substitute needed must not only furnish the place and the atmosphere, but positive and constructive leadership. Where can such a substitute be found?

Leadership Is Needed; Equipment Alone Will Not Assure Success

A place of recreation and social intercourse should be provided in every community. But this has often been done with disappointing results. Many employers have spent large sums of money for just such a purpose. For a time the employees and their families used it as intended; then lack of interest appeared, the property was carelessly handled, neglect and indifference took the place of the first enthusiasm. Gradually the men for whom the place was intended dropped away, and its use became limited to a small group of the office men. It is all too easy to find well-equipped clubhouses into which employers have put not only their money, but their heart interest as well, and yet the rank and file of the employees are missing, and the principal use of these buildings is for a weekly dance by a few "white collar" men and their families.

The point to be guarded is that such a place to be effective must be run upon a plan that fits the people, and back of that plan there must be a man. Leadership is essential.

Imagine a saloon without a saloon keeper! We wonder at the influence of the saloon in politics; but have we ever really analyzed the subject to discover just what it is that gives the saloon its power, its grip upon men? If the influence of the man behind the bar and the democratic plan upon which his institution is run could be transferred to a constructive basis, what a change would come in many communities!



TWO VIEWS OF THE BENHAM Y. M. C. A. FOR COLORED FOLK. THIS BUILDING WAS ERECTED BY THE COAL DEPARTMENT OF THE WISCONSIN STEEL CO., AN ALLIED INTEREST OF THE INTERNATIONAL HARVESTER CO.

A Place, a Plan and a Man

Imagine a place equipped to meet the needs of a community as a social center, also a plan for its use that fits the people, that recognizes their natural desires, and gives them a chance to run it themselves and a man to lead the work. Remember that, unlike the saloon, this place

CONSOLIDATION COAL CO.'S Y. M. C. A. FOR COLORED MINERS AT BUXTON, IOWA

is established by mutual agreement of employer and employees, both having a direct interest in it; that the plan is determined by the men themselves, with the aid of the trained leader. Add to this the further fact that this leader is the representative both of the employees and the employer and has no commercial interest in either the place or the plan, but only a desire to be the friend and helper of every member of the community. Then we have some idea of what a constructive substitute for the saloon may be, and actually is, in scores of industrial centers, not a few of them coal-mining villages.

In the mining regions of Pennsylvania, West Virginia, Kentucky, Ohio, Iowa and Washington this work has been operated successfully. Some have doubted the efficacy of such a movement because of its avowed religious motive. But for more than thirty years it has been an ally of the railroads; it has been used by the United States Government in the Panama Canal, and in the reclamation camps of the West, and by the largest as well as by some of the small industries during the last decade; and it succeeds everywhere with every group of men, white or black, English-speaking or non-English-speaking, because its motive is religious.

Plan Does More Than Merely Consume a Man's Time and Excess Energy

It is more than a club; it appeals to more in a man than his desire for social intercourse; it takes hold upon his character life at the point where loyalty, integrity, contentment and real efficiency take root. It can be made an ally, not only of industry, but of every church, school, doctor and police officer in any place. It does not violate the creed of any church member nor supplant any other agency. The fact that a state and an international organization promote and supervise its work is a strong point, for this assures stability and a choice of trained leaders (secretaries). Yet each local organization is absolutely independent.

This plan was suggested to that philosopher-operator who wants a substitute for the saloon, and he agreed to put up two buildings at two of his mines, and two more miners' Young Men's Christian Associations will result. Of course before these buildings are erected it will be discovered whether the miners and their families want this feature in their community; but no group of industrial workers of any color or creed in any part of the country has ever turned down this plan when it has been presented clearly.

Some operators testify that drunkenness has disappeared; others say that the receipts of liquors through express agencies have been cut in half, and in some places saloons have been actually closed by opening a modern industrial type of Young Men's Christian Association. It is a substitute for the saloon, and something more.

School Building in Anthracite Region

Eighteen new schools have been constructed during the last year in the five principal anthracite-producing counties of Pennsylvania—Carbon, Lackawanna, Luzerne, Northumberland and Schuylkill—at an aggregate cost of nearly $900,000. Although the greater part of the school taxes is paid by the anthracite operators, and there were many magnificent school buildings in the anthracite region before this year's construction, they and all other taxpayers welcome additional educational facilities. Many of the school buildings are utilized at night for the teaching of miners in their chosen work.

At Franklin in Carbon County a new school has been constructed, and in Lackawanna County there are five new schools—No. 7 at Carbondale, the new school at Archbald, the Wildcat school, also at Archbald, and the primary school at Jermyn. In Luzerne County have been added the Georgetown school of Wilkes-Barre township, the high school of Larksville borough, the Concrete City school of Hanover township, the G. W. Guthrie school of Wilkes-Barre, the high school of Nanticoke and the high school of Pittston. In Northumberland County there are three new schools—one at Marion Heights and two at Milton, one being known as the Grant school and the other as the central grammar school. Schuylkill County has a new school in Wayne township, the Marlin school in Norwegian township, the West Ward school in Coaldale and the Tamaqua school in Rahn township.

Two of these schools, those at Nanticoke and Pittston, cost over $200,000 each, and the G. W. Guthrie school at Wilkes-Barre cost $100,000. The aggregate cost of the list furnished by the State Board of Education at Harrisburg was $890,781.

The Dark Days

By Walt Mason

(Written expressly for *Coal Age*)

The sun's a winner, all men know; without it green things wouldn't grow, of beauty there would be a dearth, and health would perish from the earth. Oh, if it ceased to light the sky, we'd soon be tired of life and die. These facts are bromides gone to seed—so plain that he who runs can read.

Yet when the sun won't take a rest, but scoots along from east to west, day after day, week after week, we have too big a grouch to speak. "This sunshine is the bully stuff," we say, "but plenty is enough; we aren't hoggish, Sol, old chap; don't send us all you have on tap, but save a little of your glow for winter, when we're having snow."

And if the clouds obscure the sky, responsive to our heartfelt sigh, and thunder rips around and roars, and lightning splits the whole outdoors, we chortle with exceeding glee, turn handsprings in our ecstacy.

And thus the business men should greet the dark days with a nosegay sweet. If things should always come his way, and there should be no dismal day, he'd tire of such an easy graft, and say, "I wish I had a raft of obstacles and ills that blight, to show that I am built to fight!" He'd have no chance to analyze his weakness or to strength get wise; he'd gain no credit, though he won all kinds of plain and fancy mon'.

For any man who's worth a dime detests good sledding all the time. He wants to show he is a chap who has a store of vim and snap, and where the spineless critter frets, he on his nettle bravely gets, and strips disaster of its hide, and cuts a swath a furlong wide.

Dark days are good for any man; they make him use his brains and plan, conserve his capital and learn to value dollars he may earn. So, Mr. Manager, don't fret when come the days, dark, blue and wet; look forth with calm, undaunted gaze, and say, "I like these gloomy days!"

Discussion by Readers

Misuse of Black Blasting Powder in Mines

Letter No. 1—While we all agree that there is much danger in the unrestricted use of black powder for blasting coal and rock in mines, this explosive has been blamed many times for results that come from its misuse and are due to the ignorance or foolhardiness of the man rather than the nature of the explosive. For this reason I have prepared this article on the uses of black blasting powder to show that accidents resulting from its improper use may be eliminated by its proper use.

During several years of service in mines, especially those of West Virginia, I have observed that the improper uses of black powder have contributed very largely to the numerous fatal and nonfatal accidents that have occurred and resulted in much damage to mining property. In most cases extraordinary care is taken in gaseous mines to avoid accidents liable to result from the improper use of so-called permissible explosives. Competent shotfirers are being employed, the best grade of explosive is selected for blasting and noncombustible material is furnished for stemming. Moreover, as a further precaution locked safety lamps are being used exclusively and the coal dust is kept thoroughly watered by various means that are adopted.

Let us inquire to what extent any precautionary measures have been adopted in many nongaseous mines with respect to preventing accidents that are liable to result in loss of life and damage to property from the improper uses of black powder. Experienced as well as inexperienced miners are permitted to perform the work when blasting coal with black powder, and in many instances accident results from overcharges purposely made to bring the coal down in easy-loading sizes. I admit that noncombustible material is being furnished for stemming in some though not in all of the mines. Many charges of black powder have been stemmed with fine "buckdust," as the machine cuttings are commonly called, which is highly combustible. Furthermore, watering of nongassy or dry-and-dusty mines, as a rule, is not as carefully practiced as is the case in gassy and dry-and-dusty mines. Copper-tipped tamping bars and copper-tipped needles are being used by some, but not by all of the miners.

It appears to me that in this respect the wagon is being placed before the horse and that it is necessary to adopt proper remedies. It seems reasonable that we can increase the safety of the mines by permitting only competent men to blast the coal when using black powder and by insisting on their using reasonable and safe charges, stemming with noncombustible material and using copper-tipped tamping bars and copper-tipped needles only.

By examining the annual reports of the West Virginia Department of Mines, it will be observed that a number of mine explosions in which many miners were killed were caused by the improper use of black powder; and the damage done to the mines and delays in operating after the trouble occurred has caused large losses to both operators and miners. Many roof falls that have killed miners have been due to the improper placing of shots too close to the roof, thereby making the latter unsound. Roof falls amounting to thousands of cubic yards annually and which must be removed at the expense of the operator are caused by pointing auger holes too near to the roof, causing it to become unsound and to fall.

Again, owing to the overcharges of black powder the mine atmosphere naturally is not as good as it would be if proper amounts of black powder were being used. Although the West Virginia mining law requires that miners shall not enter their working places until 20 min. has elapsed after firing a shot, this requirement of the law is in many cases not being obeyed. Of course, when miners rush to the face of the working places immediately after the coal has been shot they expose themselves to dense volumes of powder smoke, which if inhaled day after day will eventually affect their health and reduce their ability to perform a good day's work.

It cannot be denied that, in the past, black powder used by inexperienced mine employees has been the cause of mine disasters causing loss of life and injury to employees and damage to property. In my opinion, only experienced miners should be permitted to blast the coal, as it is necessary for the men doing such work to know by experience the amount of powder required to bring the coal down and avoid using an excessive charge. Men doing the blasting should be taught by men experienced in this work and should not be permitted under any consideration to fire shots until they can give satisfactory proof of competency to the mine officials.

Unavoidable mine accidents will happen, but avoidable ones caused by inexperienced miners blasting the coal should be eliminated. It is deplorable when we read annual reports that have been issued by the West Virginia Department of Mines to observe that fatal as well as nonfatal accidents have been caused by the carelessness of the miners; and many of these accidents can be attributed to the improper use of black powder by inexperienced men. Naturally, miners do not like to work in mines where accidents constantly occur. In many instances where accidents have occurred the mine was idle that day and perhaps for days previous, depending of course on the severity of the accident. The burden of these losses, financially and otherwise, must be borne by the miners and the operators.

To the astonishment of West Virginians, past history shows that mine disasters have occurred in what are usually termed "model mines." Investigations into the causes of these disasters revealed that blownout and overcharged blasts and blasting coal on the solid were the primary causes. If in future the blasting of coal with black powder is permitted to be done only by experienced miners, the mines will become safer for work, and as a result fatal and nonfatal accidents will be eliminated to a large extent and the safety of property enhanced.

Let us not forget that two things cannot occupy the same place at the same time; no more can we have safety

so long as we permit danger to lurk within the mines. Only experienced miners should be allowed to do the blasting of coal and handle black powder, if we expect to eliminate one of the dangers lurking in coal mines.

KARL F. SCHOEW.

Huntington, W. Va.

Removal of Powder Marks

Letter No. 1—A matter of grave importance to all miners and referred to in discussion by the National Mine Rescue and First-Aid Conference, held at Pittsburgh, Penn., Sept. 23-26, 1912, is the question of whether it is possible to so treat victims of powder burns as to efface the marks resulting therefrom. My attention was drawn to the statements made by Drs. J. J. Rutledge and W. S. Rountree, as published on p. 42 of Bulletin 62, Bureau of Mines. Dr. Rutledge stated the case of a man injured in a mine by the explosion of a blast that he, in company with others, had approached unwarned. This man had received 107 punctures of the skin, and in some of these could be seen through the skin particles as large as the end of a thumb. Otherwise, the man's physical condition was perfect.

In response to a member of the Hospitals and Safety-Station Committee as to whether or not it was advisable to wash such a wound, Dr. Rountree stated as follows:

> We have quite a number of injuries of this sort in our mining district. Long ago, men whose faces were blackened by explosion went through life that way. They were simply treated in a way, and the coal dust remained in the wounds. In the last few years we have never sent a man away with a black face after such an accident. With a salt solution and a stiff brush, every particle of coal dust may be removed. Sometimes the coal dust is buried so deep it cannot be reached with the stiff brush, but with a curette all particles may be removed. The only way we have been successful with these patients was to immediately anesthetize, scrub with brush or curette, wash with salt solution and dress with sterile bicarbonate or some other dressing. Sometimes, after a patient goes 24 hours or so the face swells, and many particles are shoved up and are thus much easier to remove, even at that time; but by letting them go so long, more infection is caused. However, such infection is not so dangerous as infection received on the surface. The use of a stiff brush destroys some tissue, but causes no scars, and practically all the dirt can be reached with the brush.

This statement of Dr. Rountree, to the effect that he had never sent a man away with a black face after such an accident, is interesting, inasmuch as many mining men know of numerous cases where patients have recently been discharged from hospitals as cured, but with blackened faces.

As I have stated before, it is a matter of grave importance to know whether such results are due to the carelessness or ignorance of the surgeons in charge. In either case, it is the right of the coal-mining industry to know the facts. If the treatment described by Dr. Rountree is efficacious and will effect the removal of the marks of the powder, there can be no excuse for the discharge of men from hospitals as being cured, while these marks remain to disfigure their faces.

Such a disfigurement is not only a handicap to the man himself, but advertises the occupation of coal mining as one of great hazard, while it also reflects on the intelligence or efficiency of certain hospitals. Let there be a discussion in *Coal Age* that will lead to a thorough investigation of this important matter.

RALPH W. MAYER.

Roslyn, Wash.

Need of First-Aid Instruction

I agree heartily with the suggestion that first-aid instruction should be given more generally to all mine employees, so that there might always be someone around who would know a few simple things that ought to be done in case of accident. All persons should know how to stop the flow of blood from an artery; how to rescue a drowning person; what to do to succor a person in contact with a live wire, or to resuscitate one overcome by gas.

The more general need for this work of instruction was deeply impressed on me a few days ago by an incident that occurred on the tracks in front of the tipple of the mine where I work. It was early in the morning as the men were coming to the mine. I was proceeding up the track toward the mine when the engine and cab of the coal train passed me at breakneck speed. I knew at once that something was wrong, as trains were never run on the coal siding at a speed greater than 20 mi. an hr.

On reaching the tipple, my fears were realized when I learned that a young boy, who was riding to the mine on the cars, had jumped from the train before it stopped. In attempting to cross the track ahead of the moving cars, he slipped and fell. Retaining his presence of mind, however, he succeeded in rolling clear of the track, except his left leg, which was cut off by the wheels at a point above the knee. The accident was witnessed by many of his fellow-workmen who were riding in the first car. They all realized that something must be done quickly to save the boy's life, but no one understood how to stop the bleeding which would soon result in death. They only thought of getting him to the hospital as quickly as possible, and the engineer and train crew were doing all in their power to shorten the time of the trip. But the boy died that night from loss of blood.

This is not the first case of its kind that has happened and I don't suppose it will be the last. We never know who will be the next victim of accident or when an accident will occur. Hence it is our duty to do everything possible to give first-aid instruction to all mine workers. It may happen that an opportunity will never offer to apply the knowledge gained of first-aid treatment; but this is no reason why everyone should not possess himself of sufficient knowledge to give such treatment to another injured by accident. An accident is always unforeseen.

Personally I think that the mining laws of every state should compel all operators to maintain at their plant at least a few trained men who are competent to give first-aid treatment in case of accident. The mining laws of many states require mine operators to keep on hand ready for use a supply of first-aid material; but how many of these laws say anything about the training of men in first-aid work and in the proper use of the material required to be kept on hand? I would ask, What good are tools or supplies if no one present is competent to use them?

JAMES T. REYNOLDS, Safety Inspector,
Houston, Penn. Aetna Life Insurance Co.

Preventing Mine Explosions

Letter No. 5—In his Letter No. 3, *Coal Age*, July 24, p. 143, William Crooks criticizes the statement that appeared in my previous letter, May 8, p. 819, which reads, "As long as coal is mined, disasters must occur," etc. My

original copy read "As long as mine disasters occur, there will be miners to be rescued." I presume Mr. Crooks would accept the latter statement without criticism, as it does not imply that these sad occurrences are "inevitable" in coal mining. The change in the wording came in the editing of my copy.

However, while it is true that mine explosions have occurred ever since coal was mined to any considerable extent, and probably will continue to happen for some time to come, it is undoubtedly the desire and hope of all mining men that mine explosions will eventually be eliminated and remembered only as matters of history. We will all agree that that time has not as yet arrived. I firmly believe that we still have some things to learn and understand relative to the causes of mine explosions before these will cease to occur.

The suggestions offered by J. Riley, May 29, p. 938, and Edward H. Coxe, July 3, p. 27, as well as those presented by Mr. Crooks, in his letter, p. 143, are all good and practical, as means of preventing or at least reducing the number of mine explosions, if the same are strictly followed. But I would ask, Will they eliminate such explosions? It seems to me that there are other things we must know and other causes we must understand before we can expect to successfully contend with the conditions that make mine explosions possible.

How much do we know in regard to the effect of strong air currents, and the greater or less amount of available oxygen in the mine air, and to what extent these are actual factors in the initiation of an explosion in a mine, as has often been suggested by John Verner, former mine inspector in Iowa? Again, do we thoroughly understand to what extent or in what way changes of temperature, barometric pressure and seismic disturbances create conditions favorable to explosions in the mine?

It must be acknowledged by a candid mind that efficient and competent men in charge of mines have not always been a means of preventing the occurrence of explosions therein. The records show that some of the most disastrous accidents have happened in mines that are well regulated and under the best possible supervision.

Again, well-regulated mines have been operated for a number of years by such competent and trained men, without the occurrence of an explosion, and yet a little later the mine, under the same management and subject to the same conditions, as far as can be ascertained, has suddenly been the scene of a disastrous explosion. In some instances the cause may be attributed to a human factor, but there are other instances in which this cannot be shown. I want to say that only when these conditions or causes are thoroughly known and understood may we expect that mine explosions will be eliminated.

JOHN ROSE,
Former District Mine Inspector.

Dayton, Tenn.

The Pennsylvania Amendment

Letter No. 2—The recent changes in the mining law of Pennsylvania will be far-reaching in their effects and ultimately disastrous to every phase of the industry, if the predictions of many thoughtful men do not fail. By the passage of this amendment, as described in *Coal Age*, July 24, p. 145, the State of Pennsylvania has given up a substantial good and is groping for a shadowy illusion, supposedly something better.

Under the operation of the present law, the state exercises a degree of judicial and executive authority over the operation of the coal-mining industry that enables it to enforce important provisions relating to the sanitation of mines and the safeguarding of the health and lives of mine workers. Under that law, the state holds responsible for the enforcement of its provision the men who have been licensed by the state as being qualified for their official duty. Their qualification has been duly ascertained by an examination conducted by regularly commissioned officers of the state. The candidates in examination have demonstrated their knowledge of the principles and practice of coal mining and received the state certificate of competency required by law.

Since their enactment, these provisions of the law have been productive of a great advancement among coal miners, supplying them with a motive and incentive for study and resulting in the improvement of faculties that hitherto were dormant. This training has incidentally produced a higher grade of citizens. It goes without saying that a law the operation of which tends to produce more efficient workmen and to develop a higher standard of citizenship is of material benefit, not only to the coal-mining industry, but to the entire commonwealth.

It is a matter of general observation that one of the effects of the qualification required by law has been to develop mine officials of broader views. This necessary qualification has developed those faculties that have enabled men to realize that in order to produce the greatest results one must not only possess a working knowledge of his calling, but (what is of far more importance) a good knowledge of human nature.

By the amended law it would appear that the state has abrogated its power to adjudicate the operation of its mines. It may well be asked, Why has such a surrender of governmental right and authority been made?

In regard to the amendment operating to displace the legally qualified man, I am not apprehensive of such a result, since the qualified man is a profitable financial investment for every mine operator, and it is not logical to assume that such can or will be replaced by men of less technical training and ability. But it must be admitted that the abasement of the high standard previously maintained has a tendency to lower the dignity of the official position in the mine.

Unfortunately the amendment has substituted for a statutory supervision and control of mining operations an arbitrary and concentrated control invested in the mine owner or operator, who thus becomes his own law. Stated briefly, such a concentration of power is a menace to the bulwarks of our democratic government. In effect the amendment has placed the operator outside the pale of the state and made him a law unto himself. It must be admitted that nothing has been gained, but much has been lost to the miner by its passage. I believe the general opinion prevails that the amendment practically annuls the law, and the work of 35 years of constructive legislation that has materially benefited those employed in the industry has been destroyed.

In respect to the Workmen's Compensation Act, it should be observed that the act is optional in its provisions, while the amended mining law is positive and abso-

lute. These two combined produce, incidentally, an unexpected result. Whether an operator elects to work under the provisions of the compensation act, he is still clothed with the absolute power conferred upon him by the amendment.

The benefit of the act to the workman is questionable. Should a company refuse to operate under the provisions of the act, an injured employee has no recourse except to common law, which at the best is uncertain in its results. On the other hand, if a company elects to operate under the provisions of the act, the payment of the price practically exempts the management from all financial responsibility for the safety of their employees, which then becomes a secondary consideration. The premiums paid to meet the requirements of the compensation act will not come out of the net profits of the operator, who will continue to demand the same returns on his investment as before, which is his legal right. The Workmen's Compensation Act is simply an insurance in which the operator pays directly the premiums on the policies of his employees. The operator will naturally reduce his premiums to a minimum by taking only the best risks and refusing to employ those who are physically defective, or who cannot pass a medical examination, or are advanced in years. Has the state provided for such a result?

A compensation act is a good provision and a necessary one, but its burden should not rest on any one class—it should be borne by the community as a whole, since all are directly or indirectly benefited by the labor of the men whom the act is intended to protect. However, when the operation of the act means the removal of the safeguards already in force and designed to protect human life, to say nothing of the annulment, practically, of the right to labor, it becomes an unmitigated evil.

In closing, permit me to suggest that the operation of the amended law will render abortive the authority of the local executives of the law—the mine inspectors, who are still retained in their positions at great expense to the state. In the bituminous field alone there are at present 28 mine inspectors, which means an annual expenditure of over $80,000 in salaries, besides office, traveling and other expenses.

It has been roughly estimated that the expense to the State of Pennsylvania incident to the establishment of the Bureau of Insurance in connection with the Workmen's Compensation Act, for the first fiscal year, will aggregate a half-million dollars. The results will be eagerly watched.

A. M. INER.

——, Penn.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

Relation of Volume and Pressure of Air and Gas—For a constant temperature, the volume of air and gases varies inversely as the pressure supported. In this connection, pressure is often estimated as one, two, three, etc., **atmospheres,** meaning that the pressure supported by the air or gas is one, two, three, etc., times the normal atmospheric pressure at that place. This is commonly known as **Boyle's** or **Mariotte's law of volume.**

An "atmosphere" is sometimes incorrectly taken to mean normal sea-level pressure (14.7 lb. per sq.in.). Such a meaning of the term, however, would manifestly limit its application to sea level, or furnish an arbitrary standard inconvenient for use.

The term **"free air"** relates to atmospheric air at any elevation and for any condition. According to the above rule, when free air is compressed to two, three or four atmospheres its volume is reduced to ½, ⅓ or ¼ of the original volume, assuming the temperature remains constant. At the same time, the pressure or **tension of the air** is increased to two, three or four times the atmospheric pressure, whatever that may have been, or the free-air pressure, assuming always a constant temperature.

The **expansion of air,** by the same law, is accompanied by a fall of pressure, the **volume ratio** being equal to the inverse **pressure ratio,** for the same temperature. The pressure refered to here is the **absolute pressure,** or the pressure above a vacuum or zero.

Relation of Absolute Temperature and Pressure of Air and Gas—For a constant volume, the absolute temperature of air and gases varies directly as the absolute pressure.

Volume, Temperature, Pressure of Air and Gas—The relation of the volume (v), pressure (p) and absolute temperature (T), for a given weight of air or gas is expressed simply by the following formulas:

Const. Pressure	Const. Temperature	Const. Volume
$\frac{v_2}{v_1} = \frac{T_2}{T_1}$	$\frac{v_2}{v_1} = \frac{p_1}{p_2}$	$\frac{p_2}{p_1} = \frac{T_2}{T_1}$

The relations of volume, temperature and pressure of air and gas depend on two main conditions: 1. The gas may or may not be free to expand. 2. Heat may or may not be added or taken from the gas.

Addition of Heat—Two cases may arise, as follows:

(a) If the air is confined (constant volume) the rise in temperature is more rapid, since all the heat is then transformed into heat energy or **internal work,** and the pressure rises accordingly.

(b) If the air is free to expand (constant pressure) the rise in temperature, for the same addition of heat, is much less rapid. In this case, the air in expanding performs **external work** against the pressure it supports. A part of the heat added is thus absorbed in doing outside work, while the remainder, only, is available for internal work and manifest as heat energy, thus causing a lesser rise of temperature.

The Coal Age Pocket Book

Work of Expansion of Air—When air is expanded by the addition of heat the external work performed can be calculated in two ways, as follows:

1. On a heat-unit basis, by subtracting the heat absorbed, per pound of air, per degree rise in temperature, for constant volume, from the heat, per pound, per degree, for constant pressure; and multiplying this difference, which is the heat converted into external work, by the foot-pounds per heat unit; thus, since 1 B.t.u. = 778 ft.-lb.,

Heat, per lb.-deg. (sp. heat, const. pressure) ..... 0.2374 B.t.u.
Heat, per lb.-deg. (sp. heat, const. volume) ..... 0.1689 B.t.u.

Heat, per lb.-deg., available for external work.. 0.0685 B.t.u.
External work, per lb.-deg.....$0.0685 \times 778 = 53.29$ ft.-lb.

2. The external work performed in the expansion of air, per pound, per degree, can be calculated, also, very simply by multiplying the volume of 1 lb. of dry air, at 1 deg. F., absolute, and 1 lb. per sq.in. pressure (0.37 cu.ft.), by 144, the number of square inches in 1 sq.ft.; thus,

External work, per lb.-deg.....$0.37 \times 144 = 53.28$ ft.-lb.

Adiabatic Expansion and Compression—When there is no addition of heat in the expansion, or no loss of heat in the compression of air or gas, the relations of volume, temperature and pressure follow other laws than those previously given. Such expansion or compression is described as **"adiabatic,"** meaning no passage (of heat) in or out of the gas.

In **adiabatic expansion,** there being no addition of heat, the increase in volume is at the expense of the internal energy and a fall of temperature is the result, which is accompanied also by a fall of pressure.

In **adiabatic compression,** there being no loss of heat, the internal energy is augmented by the heat of compression, and the result is an increase of both temperature and pressure.

Adiabatic Formulas—The following formulas express the relation of volume (v), pressure (p) and absolute temperature (T), for any given weight of air or gas, when expanded or compressed without gain or loss of heat. In actual practice it is only possible to approximate adiabatic expansion or compression.:

$\frac{v_2}{v_1} = \left(\frac{p_1}{p_2}\right)^{0.7117}$	$\frac{v_2}{v_1} = \left(\frac{T_1}{T_2}\right)^{2.469}$	$\frac{p_2}{p_1} = \left(\frac{T_2}{T_1}\right)^{3.469}$
$\frac{p_2}{p_1} = \left(\frac{v_1}{v_2}\right)^{1.405}$	$\frac{T_2}{T_1} = \left(\frac{v_1}{v_2}\right)^{0.405}$	$\frac{T_2}{T_1} = \left(\frac{p_2}{p_1}\right)^{0.288}$

It is important to observe that adiabatic expansion or compression always involves a change in temperature. Where the temperature is maintained constant, by adding heat in expanding, or extracting heat (cooling) in compressing, the change in volume is described as **"isothermal"** expansion or compression. In practice, it is only possible to approximate isothermal conditions in the expansion or compression of air or gas.

The application of the above formulas necessitates the use of logarithms.

Inquiries of General Interest

Space Occupied by Sized Coal

Kindly state the space required to store the different sizes of anthracite and bituminous coal in bins.

INQUIRER.

Dayton, Ohio.

The space occupied by coal stored in a bin depends chiefly on the specific gravity of the coal, and to some extent on the size to which the coal is broken.

The average specific gravity of anthracite may be taken as 1.5, making the weight of a cubic foot of average anthracite $62.5 \times 1.5 = 93.75$ lb. The space occupied by 1 long ton (2240 lb.) of solid anthracite is therefore $2240 \div 93.75 = 23.9$ cu.ft. It is estimated that mine-run coal, both anthracite and bituminous, will occupy about two-thirds more space than the same weight of solid coal. Therefore, the space occupied by 1 ton of mine-run anthracite would be approximately $23.9 \times 1\frac{2}{3}$ = say 40 cu.ft.

The specific gravity of bituminous coal varies from 1.2 to 1.5. Taking the average specific gravity of this coal as 1.35, the weight of 1 short ton (2000 lb.) of solid bituminous coal is $2000 \div (62.5 \times 1.35) = 23.7$ cu.ft. Therefore, a ton of mine-run bituminous coal will occupy approximately $23.7 \times 1\frac{2}{3}$ = say 40 cu.ft.

These calculations give the general rule that a long ton of anthracite or a short ton of bituminous coal (mine-run) will occupy approximately 40 cu.ft. of space in a bin.

In the sizing of coal, the larger sizes, as "broken" or "egg," may occupy slightly more and the smaller size of "chestnut" slightly less than the space mentioned. But the finer grades of pea, buckwheat and rice coal, owing to their greater purity or freedom from refuse, weigh lighter, and consequently require a somewhat greater space per ton, than that mentioned. However, these differences will not exceed 5 per cent., in any case.

Effect of Storage on the Analysis of Coal

If bituminous coal is stored in the open for six months, and an analysis is made at the beginning and end of this period, how would the extent of deterioration be determined?

R. T. M.

Terre Haute, Ind.

The extent of deterioration in the coal would be determined by the percentage of loss in heat value. For example, the difference in the calorific values of the coal at the beginning and at the end of the period of storage will show a loss in heat units (B.t.u.). The percentage of this loss is then calculated from the original heat value of the coal.

This will be clearly understood from the following tabulated results of the experiments carried out by the United States Government for the purpose of showing the effect of storage on coal. Four different types of coal were selected for this purpose, as follows: 1. New River coal, West Virginia, as being the type of coal largely used by the Navy. 2. Pocahontas, Va., as being the type of steaming and coking coal used in the Eastern states. 3. Pittsburgh, Penn., as representing a rich coking and gas coal. 4. Sheridan, Wyo., as representing a sub-bituminous or black lignite, much used in the West. The results of the experiments were as follows:

		Heat Value of Coal (B.t.u.)			
Kind of Coal	Storage Conditions	As Stored	After 1 Yr.	After 2 Yr.	Per Cent. Loss
New River, W. Va.	Run-of-mine coal exposed to air indoors; Portsmouth, N. H.	8,754	8,748	8,734	1 yr., 0.07 2 yr., 0.23
	Run-of-mine coal exposed to air outdoors, uncovered; Portsmouth, N. H.	8,775	8,760	8,722	1 yr., 0.60 2 yr., 0.17
Pocahontas, Va.	120-ton pile, run-of-mine coal, outside; Panama	8,794	8,762	....	1 yr., 0.36
Pittsburgh bed	Run-of-mine coal, open bin, outdoors, Ann Arbor, Mich.	8,541	8,526	....	1 yr., 0.17
Sheridan, Wyo.	Run-of-mine coal, open bin 5 ft. deep; Sheridan, Wyo.	7,370	....	7,135	2¼ yr., 3.19
Sub-bituminous	Run-of-mine coal, closed bin 5 ft. deep, Sheridan, Wyo.	7,370	....	7,094	2 yr., 3.75

The table gives a condensed summary compiled from the results of a large number of test determinations. To eliminate the effect of incidental impurities, the calorific values are calculated on a moisture-free, ash-free and sulphur-free basis. The results of the experiments show a loss in heat value of less than 1 per cent. for New River, Pocahontas and Pittsburgh coal stored in the open. The Wyoming coal alone of these four types showed any considerable loss in heat value during storage. This greater loss was undoubtedly due to the special character of the Wyoming coal.

In one case coal stored for two years at Key West, Fla., showed a loss in heat value ranging between 1 and 2 per cent. From these facts, and a large number of similar experiments, it may be stated that the loss in heat value of coal during storage is greatly overestimated.

Permit me, in closing, to add a few brief words regarding the storage of coal under water. Storage under these conditions undoubtedly preserves the heating value and the physical strength of coal; but such storage practically makes necessary the firing of wet coal and the consequent evaporation in the furnace of added moisture varying from 1 to 15 per cent., according to the kind of coal. This factor is an important drawback in many cases to the under-water storage of fuel.

On the other hand, submerged storage is an absolute preventive of spontaneous combustion and may on that account be sometimes justified; but unless the storage period is to be longer than two years, there seems to be no ground for storing coal under water merely for the saving in calorific value to be obtained.

PERCY N. COUPLAND,

New York City.

Examination Questions

Alberta (Canada) Examination, June 15-17, 1915

(*Selected Questions*)

Ques.—Water accumulates at the rate of 200 gal. per min. at the foot of a shaft 600 ft. deep. If power for pumping is available for 8 hr. in the 24, what will be the horsepower of the pump required to drain the sump?

Ans.—The quantity of water to be handled, in this case, is $200 \times 24 \div 8 = 600$ gal. per min. Then, using a column pipe having a diameter of $d_c = 0.25\sqrt{600} =$ say 6 in., the velocity head in a pipe of this size may be ignored, and the effective head under which the pump must operate is

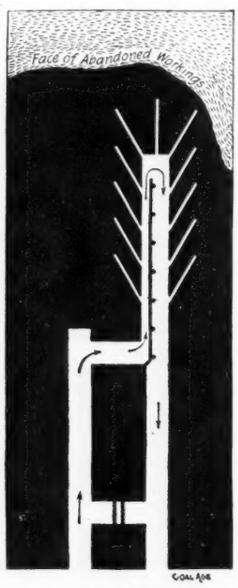
$$h_1 = h + \frac{G^2 h}{800\, d_c^5} = 600 + \frac{600^2 \times 600}{800 \times 6^5} = say\ 635\ ft.$$

Then allowing 15 ft. for a sump, the total head is $635 + 15 = 650$ ft. Finally, assuming the efficiency of the water-end of the pump as 75 per cent., the required horsepower is

$H = 0.00034\, Gh_1 = 0.00034 \times 600 \times 650 =$ say 135 hp.

Ques.—A place is approaching old workings containing water. How would you work it, having due regard to safety? Describe some method whereby you could control a flow of water through a borehole.

Ans.—When approaching old workings containing water, a single heading should be driven in advance, as shown in the accompanying figure. A drillhole should be kept 20 ft. in advance of the heading, and flank holes should be driven in each rib, at an angle with the heading, about 2 yd. apart. A brattice should be erected from the last breakthrough to conduct the air current to the face of the heading, as shown in the figure. A sharp lookout should be kept for the first appearance of water or gas, and plugs should be kept ready for use in case one of the boreholes tapped the water in the old workings. Only safety lamps should be employed in this work.



A PROSPECT HEADING

In general, a plug driven well into the mouth of a hole will be sufficient to stop the flow of water. In case, however, it is desired to allow this water to drain from the hole and to control the flow, a heavy cross-timber should be set firmly into the rib, in front of the hole, and so arranged as to give the needed support to a pipe inserted into the hole. This pipe should be provided with a suitable cock to control the flow of the water. The end of the pipe inserted into the hole should have a slightly conical shape so that it can be driven tightly into a hole in the plug and form a watertight joint.

Ques.—Describe the operations in advancing a working place in a longwall face.

Ans.—In longwall working, when a miner enters his working place in the morning, his first duty is to examine carefully the condition of the roof and face of the coal and to reset any timbers that may have been displaced by the falling coal during the night. Having made the place safe for work the next step is to load out the coal, breaking those pieces that are too large to be loaded into the mine cars. Any loose slate that has fallen with the coal is thrown aside to be used for building packwalls.

Having loaded all the fallen coal and cleaned up the face, any new timbers required should be set in position. The work of undermining the coal should then be commenced, setting the necessary sprags and timbers as this work proceeds. After the coal has been undermined, all tools should be removed from the face to a safe place. Any back timbers may now be taken out and the packwalls extended as required. Before leaving the place for the night, the miner draws all sprags or other timbers supporting the coal at the face so as to permit the gradually increasing roof pressure to break down the coal during the night.

Ques.—A mine map shows that at one point in an entry the elevation is 742.5 ft. and at another point 100 yd. distant it is 748.5 ft. What is the average grade between these two points, (*a*) expressed in percentage and (*b*) expressed in inches per yard?

Ans.—The difference in elevation, $748.5 - 742.5 = 6$ ft., is the vertical rise of the entry in 100 yd. or 300 ft.

(*a*) The percentage of grade is, therefore, $6 \times 100 \div 300 = 2$ per cent.

(*b*) The rise is $6 \times 12 = 72$ in. in 100 yd., or 0.72 in. per yd.

Ques.—What quantity of water is contained in a sump 100 ft. in length, 7 ft. 6 in. in width and 5 ft. 3 in. in depth?

Ans.—The cubic contents of this sump is $100 \times 7.5 \times 5.25 = 3937.5$ cu.ft. The capacity of the sump if filled with water is then $3937.5 \times 1728 \div 231 = 29{,}454+$ gal.

Ques.—Humidity tests show that the percentage of saturation in the intake air is 40 and the return air 90. Parts of the mine being dry and dusty, what action would you think necessary?

Ans.—The question is not complete as it does not state the temperatures of the intake and return air without which no intelligent answer can be given. Intake air at 80 deg. F. and 40 per cent. humidity holds as much moisture as return air at 55 deg. F. and 90 per cent. humidity, which would not indicate any drying action of the air in passing through the mine. But an intake temperature equal to or greater than the return shows the need of humidifying the intake air.

Coal and Coke News

Harrisburg, Penn.

Ten of the largest and strongest casualty insurance companies of the United States have pooled their interests for the insurance of coal mines. In order to reduce to a minimum the risk of these companies, especially from the catastrophe hazard, they have organized as their medium of operations a Department of Inspection and Safety, and this has fixed its headquarters in Pittsburgh.

The offices of the associated companies have been opened in the First National Bank Building, and from these the inspectors and the consulting engineers of the Insurance companies doing business in coal mines in the state will direct their examinations of mines and coöperate with the insurance companies in fixing schedules or merit rates whereby a reduction in premium may be earned by any mine for every improvement which it may make for the safety of its operation.

It is expected that about Oct. 1 the State Compensation Board will announce the details upon which employers of labor may insure themselves against liability under the workmen's compensation act which goes into effect on Jan. 1, 1916. The regulations themselves will be most stringent. Whether the employer has a large or a small force of workmen, whether he is engaged in business alone or is part of a great corporation, whether he is backed with large or small capital, the paramount object is to make sure that in case of accident to an employee he or his beneficiaries will be compensated according to the law.

The proposal made that the employers that come under the act combine in a mutual enterprise, to make insurance as cheap as possible, has not yet been decided upon, but there is no doubt that out of it will grow an immense private corporation sustained by fixed contributions paid in by the members. The State Board, which consists of the Attorney General, Insurance Commissioner and State Treasurer, will see that the rates of payment will be sufficient to guarantee the solvency of the fund at all times. The state will make protection as liberal as possible. It will not permit extortion nor unreliability in any way. Aside from permission for the organization of private associations, the state will sanction the solicitation of business by regular insurance concerns unaffiliated with other businesses; it will permit a single employer to maintain his own insurance fund under adequate guarantee; and the state itself will establish a fund at rates that will enable employees to insure themselves at the lowest possible cost.

Details will be announced in time to give all employers abundant opportunity to study them and to decide which plan they prefer. The Compensation Board will profit by the experiences and mistakes of other states. Ohio seems to be regarded as the premier state in the compensation line, and it is likely that the Pennsylvania Board will consult considerably with officials from Ohio. Other states will also be consulted.

It is understood to be the desire of the Governor and of all concerned that no time be wasted in costly experiments, but that Pennsylvania shall examine the work in other states and begin at the point at which the pathfinders of those states have arrived.

PENNSYLVANIA

Anthracite

Middleport—The eastern Pennsylvania Collieries Co., a small company operating a colliery near Middleport, has closed its works, following a period of hardships, due to fire and a flooded condition of the mine which could not be overcome.

Tamaqua—The second annual field day and first aid meet of the Gaskill allied companies comprising the Maryd, Hazle-Brook, Upper Lehigh, and Midvalley collieries, will be held at Hazle Park, Hazleton, on Aug. 27, 1915. Eleven teams will contest for the handsome trophy cup which was won last year by the Upper Lehigh inside team. The cup must be won three consecutive years to become the permanent property of the winners.

After extensive drilling operations the officials of the Silver Creek colliery, Philadelphia & Reading Coal & Iron Co., are convinced that there is no danger to their workings from the accumulated water in the abandoned Alliance colliery which adjoins their property, and which gave them some concern, due to the large body of water which has found its way into the idle mine.

The Black Ridge colliery of the Hazle Mountain Coal Co. has been abandoned and the company is selling the complete equipment. The officials of this firm, which is a branch of McTurk & Co., will go with the latter company to a new operation near Girardville.

Chauncy—Lightning hit the headhouse of the Gaylord colliery during a recent storm, and but for the prompt action of several of the employees doing night work it might have been destroyed or badly damaged. Employees are accustomed to take part in fire drills and the knowledge thus gained came in handy. The company maintains fire hydrants and several hundred feet of hose on the premises, hence it was but a few minutes before several strong streams of water were playing on the headhouse. Carpenters were put to work forthwith to repair the damage and the colliery worked as usual the next day.

Shenandoah—A recent button strike which threw 1000 men and boys out of work for four days at the William Penn colliery of the Susquehanna Coal Co. has been amicably adjusted by the miners' union and the men have returned to work.

Hazleton—The mining companies are rapidly disposing of their real estate holdings, other than actual coal land. Some time since A. Pardee & Co. sold all of the company houses which for years it had rented to the miners. This firm was soon followed by the Lehigh Valley Co. taking the same action, disposing of 24 houses to a manufacturing corporation.

Pottsville—Madeira, Hill & Co., of Philadelphia, is rapidly extending its coal operations in the Schuylkill district. Next week it will place in operation the new Black Creek colliery, which will have an output of 1000 tons daily and give employment to 500 people.

The present summer has been an exceptionally wet one in the anthracite region and instead of the mining companies being compelled to haul water long distances for boiler supply, as in previous years, they have been put to additional trouble and expense to keep the mines clear of the excess water. The past week the rainfall was particularly excessive and many of the collieries are in danger of being flooded out.

Pittston—Improvements are being made in the old air and pumping shaft of the Pennsylvania Coal Co. at the foot of Broad St. These improvements were started some time ago. The shaft, originally a small one, has been enlarged to 10x20 ft. and sunk to the lowest vein, after which concrete walls were constructed from the rock to the surface. A cap has been placed on the concrete walls bringing them up to a point somewhat above the level of the ground in preparation for the erection of a new steel tower in place of the old wooden structure that stood over the shaft for many years.

After working little more than half time for the last two months, collieries of the Lehigh Valley, Pennsylvania and Hillside Coal & Iron companies went on a full schedule this week and will continue to work steadily for an indefinite period.

Lansford—The report is current that the Lehigh Coal & Navigation Co. intends shortly to start washing coal from the immense culm banks in this vicinity and at Coaldale and Nesquehoning. This will mean work for quite a number of men who have been idle for some time.

Bituminous

Indiana—During a cloudburst the waters of a small stream rose so rapidly that they flowed into the mouth of the Sample Run mine, endangering the lives of the 450 miners working therein. The regular exit being cut off the men floundered about in water up to their necks for almost a mile, when they reached an air-shaft and climbed to safety. The mine will be idle for two weeks until the water can be pumped out.

Irvonia—Inability to secure prompt shipment of lumber for work on rebuilding the tipple at the Evans plant of the Evans Coal & Coke Co. has delayed work on construction so that it will probably be a month before the improvements

that have been going on at that place for the past six weeks will be completed. Of the improvements planned, the air shaft and the gasoline haulage system have been completed. The total work will entail an expenditure of approximately $10,000.

Lynn Station—Orders have been issued by the American Connellsville Coal & Coke Co. for the firing of the entire plant at American No. 2, located at Lynn Station. This is the old Francis No. 1 plant of the Sunshine Coal & Coke Co. and consists of 240 ovens. For some time past repairs have been made in order to have the plant ready to fire.

Pittsburgh—The towboat "Exporter" recently left Pittsburgh with 6 barges of coal containing about 90,000 bushels, and one barge of manufactured steel for the Louisville market. The stage of the river was rather low.

Connellsville—During the recent past, a number of furnaces have required repairs. This has curtailed the fuel shipments from the Connellsville region and thrown considerable coke back upon the producers. It is considered that this condition is, however, only temporary. About ¾ of the available ovens in the district are in blast and indications are good for a further increase in the production.

WEST VIRGINIA

Fairmont—The Annabelle plant of the Four States Coal Co. has been closed, but it is believed will resume operation shortly. This plant employs about 800 men, and a temporary shutdown for repairs and to allow of certain changes in the arrangement of the mine and the policy of the operating company was necessary. It is believed, however, that this plant will be operating at full capacity again in a short time.

MARYLAND

Cumberland—The largest wheatfield in the State of Maryland is said to be owned by the Consolidation Coal Co. This field contains 128 acres and lies adjacent to the old national pike between Cumberland and Frostburg. It was cultivated under the supervision of Louis Rase, farm superintendent of the company, and the yield of grain is said to be extraordinarily heavy. The development of this farm by a coal mining company is being carefully watched by farmers throughout the state.

ALABAMA

Birmingham—The coal operators of the Birmingham district are interested in the bill before the legislature giving the state jurisdiction over the Mobile docks. This will affect shipping of coal from Birmingham but whether favorably or unfavorably is not yet determined by the coal men.

Governor Henderson has assembled a mass of information on the subject of taking the convicts out of the coal mines and lumber camps, and has sent a special message to the legislature. He is opposed to the bill now before the legislature which provides for the removal of convicts from the mines. The bill is being vigorously seconded by the miners.

Jasper—The Sunlight Coal Co. is now operating mines near Jasper by the stripping process. The coal is of excellent grade and lies from 5 to 15 ft. below the surface of the ground. Shipping will be begun in about two months. The stripping of coal deposits is a new method of coal mining in Alabama.

KENTUCKY

Middlesboro—News reaching here is to the effect that 300 employees of the Catron's Creek Coal Co. have gone out on strike, demanding recognition of the recently formed union and reinstatement of two men who, it is alleged, were discharged as a result of their activity in unionizing the camp.

OHIO

Columbus—The Piney Fork Coal Co. of Columbus, which is developing a stripping operation in Jefferson County, Ohio, 12 miles west of Steubenville, has been delayed to a large extent by the excessive rainfall during the past two months. The work of laying the permanent tracks and switches is progressing as fast as possible under the circumstances. According to General Manager J. W. Blower the operation will not be ready before Sept. 10. The huge steam shovel is completed and on the cars for shipment to the operation.

Monsarrat Bros., of Columbus and Corning, are arranging to market their product direct instead of through jobbers as has been the case in the past. The company has an office in the Hartman Building in Columbus.

Cambridge—The trouble at the Little Kate mine of the National Coal Co., located in the Cambridge district has been settled and work was resumed Aug. 9. The trouble arose over lack of safety arrangements. The company has agreed to build an interior opening and the Ohio Mining Department extended the time for completing the opening for 30 days. About 150 men are employed at the mine.

Brilliant—When the property of the Dexter Coal Co. of Brilliant, Ohio, was offered for sale in a bankruptcy proceeding by Receiver J. C. Ault, there were no bidders and the property will be readvertised.

New Lexington—The announcement is made that a number of Hocking Valley mines have been closed down indefinitely because of lack of demand for Ohio coal. The operations closed recently were Mine No. 266 at Hollister, Ohio; Mine No. 254 at Jacksonville, Ohio, and Mine No. 268 at Rendville. About 800 men were thrown out of employment.

ILLINOIS

Carlinville—A hearing is in progress in the Macoupin County Circuit Court in the injunction suit brought by the Superior Coal Co. against Louis H. Miller and others to restrain them from drilling oil wells through the coal rights of the Superior company. The question at issue is whether the coal company's rights apply to all minerals, including the oil-bearing sand. A temporary restraining order has been issued. The coal company contends that drilling through the coal veins will damage the property and cause great loss. The fear is that gas pockets would form and there would be explosions. The coal company asks that if the boring for oil is permitted to continue, it be compensated with ⅛ of the oil findings. A large number of witnesses have been called and the hearing is expected to continue several days.

Percy—The Willis Coal & Mining Co. has discontinued operations at three of its mines and is operating only one. The company finds that it can buy coal in the open market to better advantage, at the current prices, than it can mine it, and is filling its contracts in this manner.

Belleville—Stephen Krezo has been brought here from Marissa, Ill., to have his mental condition inquired into. He was entombed in the Royalton, Ill., mine Oct. 27, 1914, when 58 miners were killed by an explosion, and it was four days before he was rescued. His mind is said to have been affected by the experience.

COLORADO

Denver—All the large coal companies in this state with the exception of the Colorado Fuel & Iron Co., have organized a mutual insurance company to carry the indemnities imposed by the new workmens' compensation law which went into effect Aug. 1. The Colorado Fuel & Iron Co. has arranged with the state authorities to carry its own insurance. The mutual company will write insurance for its various members at the rate of $4.60 per hundred dollars of payroll. It is expected that, unless unusual disasters occur during the first year of the experiment, the company will find it possible to considerably reduce this premium. Since no profit is contemplated from the maintenance of this insurance company, it seems reasonable that it can conduct its business and meet all ordinary obligations at a much lower rate of premium than can the regular insurance concerns.

Trinidad—The annual first aid contest of the Victor-American Fuel Co. coal camps will take place at Walsenburg on Aug. 28.

The Colorado Fuel & Iron Co. is completing the erection at Sopris of a modern clubhouse for the miners and a domestic science department and gymnasium building for the school.

Delagua—Delagua and Hastings, the two largest properties of the Victor-American Fuel Co. in the Trinidad district, began working full time the week beginning Aug. 8. About 50 additional men will be employed. Old coke ovens which have not been burning since the strike was called in September, 1913, will be put in operation.

FOREIGN NEWS

Havre, France—Miners in the Mons District recently went on strike, according to reports received at Havre. Groups of these miners had friction with German soldiers and a serious riot followed, during which two Germans and several miners were killed. It is reported that intense unrest prevails throughout the Mons District.

Toronto, Ont.—The Dominion Coal Co., of Sydney, N. S., is negotiating with the Intercolonial Ry. for the transportation by rail of a large tonnage of coal to Quebec and Montreal. There is a marked scarcity of vessels for the St. Lawrence trade and as there is a considerable shortage of railway freight it is probable that a satisfactory arrangement will be effected.

London, England—The Foreign Office, through a statement, recently explained that the order prohibiting the exportation of coal to other than British possessions did not signify a total prohibition of the trade. Firms making shipments to such places hereafter will be required to obtain a special license. It is said that this order was necessary because of legislation regulating the price of coal in Great Britain.

Edmonton, Alta.—At the annual meeting of the Edmonton Standard Coal Co., Ltd., on July 30, it was decided to remove the headquarters of the company from Toronto to Edmonton. General manager, W. M. Munns stated that owing to a rise in the Saskatchewan River the old workings had been abandoned and that work had been commenced in sinking a new shaft on the north side of Rat Creek, near the railway, which would improve the company's transportation facilities. A bond issue of $50,000 will provide the funds required for machinery and equipment.

PERSONALS

William G. Polk, secretary of the Hazard Coal Co., with offices in the Paul Jones Building, Louisville, has been elected as the coal mining member of the Louisville Rotary Club.

W. J. Jenkins, president of the Western Coal & Mining Co., president of the Union Fuel Co., and vice-president of the Consolidated Coal Co., St. Louis, has gone on an extended vacation trip.

Robert D. Reeves, assistant general freight agent of the Illinois Central and Yazoo & Mississippi Valley railroads, has been named vice-president and general manager of the W. G. Coyle Coal Co. at New Orleans, following a plan to enlarge and develop the operations of the latter company in that port.

Edward Barlow, who was formerly with the Montgomery County Coal Co. and more recently was proprietor of the Herrin (Ill.) Journal, has disposed of his newspaper and taken a position with the Lumaghi Coal Co. at St. Louis. He is a son of Harry Barlow, superintendent of the Black Briar Mine at Johnston City.

John W. Gates of Welch, W. Va., has been appointed district mine inspector of the Fourteenth District of that State with headquarters at Williamson. Mr. Gates succeeds P. P. Kerr, who resigned recently to accept a position as mine superintendent for the Yukon-Pocahontas Coal Co., Yukon, W. Va. Mr. Gates is a practical mining man of wide experience, and well fitted for the position which he now holds.

R. Y. Williams, formerly director of the Illinois State Miners and Mechanics Institute, has been appointed safety engineer for the Delaware & Hudson Co. This is a new office in the anthracite coal region. Another new office is that of efficiency engineer for the same company, to which A. E. Lister has been appointed. C. A. Straw has been appointed mechanical engineer and M. A. Walker, assistant mechanical engineer for the same company. These four offices have been created instead of filling the position of the late C. C. Rose, general superintendent.

OBITUARY

Alexander Dempster, aged 79 years, his wife and his chauffeur, were instantly killed in an automobile accident on Aug. 2, while his son, James G. Dempster, aged 32 years, was severely injured. The family were returning from Baltimore, Md. They were motoring through the mountains and the chauffeur was hurrying to reach Ligonier before a rapidly approaching storm. The car had just passed the Mountain Inn at Ligonier, when it careened to one side, struck a huge oak tree and plunged over the embankment carrying the occupants with it. Mr. Dempster was born in Scotland and came to Pittsburgh in his youth. He served in the Union army during the Civil War. Returning to Pittsburgh he became a civil engineer. Later he became interested in the western Pennsylvania coal industry, acquiring several mines which he operated independently with great success. Some years ago he disposed of his holdings to the Pittsburgh Coal Co. and became a director of that corporation. At another time he was a director and president of the Monongahela River Consolidated Coal & Coke Co. His interests were numerous and scattered of recent years as he became an investor in lead and zinc mines in Missouri and in timber tracts and stone quarries. He was one of the oldest members of the Duquesne Club. Mr. Dempster is survived by four sons, James, Arthur, Samuel and D. M. Dempster, and one daughter, Mrs. E. Bruce Hill.

RECENT COAL AND COKE PATENTS

Grate. C. B. Roberts, Belfast, Maine., 1,138,976, May 11, 1915. Filed Apr. 6, 1914. Serial No. 829,916.

Miner's Drill. S. T. Skeen, Sandoval, Ill. 1,140,077, May 18, 1915. Filed Apr. 24, 1914. Serial No. 834,035.

Furnace Grate. H. Benton, Elizabeth, N. J., 1,139,097, May 11, 1915. Filed Apr. 18, 1912. Serial No. 691,693.

Automatic Stoker. A. C. Nelson, Duluth, Minn., 1,138,501, May 4, 1915. Filed Dec. 30, 1913. Serial No. 809,555.

Smoke Consumer. H. Kleman, Pittsburgh, Penn., 1,139,194, May 11, 1915. Filed Aug. 29, 1910. Serial No. 579,519.

Coke Producing Plant. F. Tschudy, Birmingham Ala., 1,139,088, May 11, 1915. Filed June 17, 1911. Serial No. 633,848.

Coal Breaker and Scraper. J. P. Considine, Detroit, Mich., 1,138,627, May 11, 1915. Filed Nov. 21, 1913. Serial No. 802,204.

Locomotive Boiler Furnace. F. F. Gaines, assigner to American Arch Co., New York, N. Y., 1,138,060, May 4, 1915. Filed July 24, 1913. Serial No. 780,968.

Apparatus for Cleaning Smoke Tubes of Boilers. C. H. Shepler and J. W. Shearer, San Francisco, Calif., 1,139,911, May 18, 1915. Filed Mar. 24, 1914. Serial No. 826,952.

Fuel Feeding Apparatus. R. Niedergesaess, assignor to American Smokeless Burner Co., a corporation of Washington, 1,139,708, May 18, 1915. Filed Jan. 15, 1914. Serial No. 812,254.

INDUSTRIAL NEWS

Birmingham, Ala.—Six barges have been chartered by the Tennessee Coal & Iron Co. from the Alabama & New Orleans Transportation Co. for the transportation of coal down the Warrior River.

Harrisburg, Penn.—The Bureau of Anthracite Statistics reports that approximately 1,350,485 tons less of anthracite were shipped to market in the first six months of this year than during the same time in 1914.

Philadelphia, Penn.—The Pennsylvania R.R. for the month of July has reported an increase in the loaded car movement, in which shipments of bituminous coal eastward have contributed to the extent of 1.9 per cent.

Maxine, Ala.—The Pratt Consolidated Coal Co. has been receiving orders so rapidly that it has put on a night shift as well as a day shift on the steamer "M. Carney," which is used in towing coal barges from Maxine to Mobile.

Philadelphia, Penn.—The export of coal to foreign markets shows a considerable increase from this port during the past month. Exports of anthracite and bituminous amounted to 171,027 tons as compared with 59,855 tons shipped during the same period of last year.

Mobile, Ala.—The Mobile Coal Co. recently awarded a contract to the Slidell Dry Docks & Ship Building Co. of Slidell, La., for the construction of six barges, to be used in the Warrior River coal trade. The new fleet will be towed by the steamer "Martha Hennen," plying between the coal mines and Mobile.

Washington, D. C.—The Interstate Commerce Commission has announced a further suspension, from Aug. 30 until Feb. 29, of the Chesapeake & Ohio tariff which provides for an increase in rates on bituminous coal, carloads, from West Virginia to certain points in Kentucky. The previous suspension was from May 2 until Aug. 30.

Denver, Colo.—Denver & Salt Lake R.R. (formerly the Moffatt road) has been denied a petition for a rehearing in recent rulings of the state public utilities commission whereby freight rates on coal from the northwestern Colorado coal field to the eastern state line were materially reduced. This affects shipments to Kansas and Nebraska points.

Scranton, Penn.—It is stated that the large armory of the National Guard in this city is in danger of sinking into a mine which underlies the land on which the structure has been built. In order to overcome the difficulty the state authorities have decided to partly fill the old working and support the roof with massive concrete abutments.

Huntington, W. Va.—The Chesapeake & Ohio Ry. broke its coal-loading record in July by almost 8000 tons. The total loading for the month on the system was 2,224,020 tons. The best record of any previous month was established in August,

1914, by the loading of 2,216,460 tons. It is thought that this record for one month may be again broken in August.

Pittston, Penn.—Dredging coal deposits from the bed of the Susquehanna River has never been successfully undertaken north of Wilkes-Barre, but the Citizens Electric Illuminating Co. has purchased an equipment and plans to remove coal from the river bed just south of the Lackawanna River outlet. A centrifugal pump driven by a vertical engine will be employed.

Philadelphia, Penn.—Since the British Government has issued its Orders in Council prohibiting any exports of coal after Aug. 30, except to the colonies, the shippers of bituminous coal from this port expect to share largely in the increased demand from abroad, especially from those countries who as allies have been able to secure shipments from Great Britain.

Meadville, Penn.—It has been announced that the Phoenix Iron Wks. will be materially enlarged. Permission has been granted for the company to increase its capital from $200,000 to $300,000 for the purpose of enlarging the plant and increasing its output. It is proposed to develop to full capacity the plate or tank shop, the foundry and the boiler shop. It is estimated that the monthly payroll will be increased by at least $5000.

Pittsburgh, Penn.—James S. Boggs and Charles W. Theis were recently appointed receivers of the Meadowlands Coal Co. by Judge A. B. Reid. The appointment of Mr. Theis was made after a conference between counsel for the bankrupt company and the creditors. The former receiver was appointed permanently, having served for several weeks as temporary receiver. The Court fixed the bonds of the receivers at $10,000 each.

Spokane, Wash.—Reports reaching here from Glacier, Washington, state that a coal strike has been made by Albert Vaughan who has organized the Bituminous Coal Association. The vein is said to be 27 ft. wide at the outcropping. The Washington Anthracite Coal Co. is reported to have made the discovery of good coal on its property near Glacier. The vein is said to be 14 ft. at the lower level, 1400 ft. below the surface. There is 2000 ft. of tunnel at this level.

Baltimore, Md.—Railroads entering this city are rushing equipment orders and rolling stock that is not needed for immediate use is being repaired and put in good shape. The Pennsylvania R.R. will within a few days begin the construction work on a new coal pier, and the Baltimore & Ohio has about completed plans for a large new pier to supplement the present one at Curtis Bay. The pier now in use has an extreme loading capacity of 1000 tons per hour on each side.

Fairmont, W. Va.—Contract for the construction of the Helens Run Ry. from the Baltimore & Ohio at Worthington to the Helens Run coalfield, a distance of about 6 miles, has been let to A. L. Anderson & Bros., Inc., of Altoona, Penn. Men have already been put to work along the recently surveyed line for the purpose of preparing for grading and bridge building, which will start shortly. Several hundred men will be employed in the construction work which will be pushed as fast as possible.

Philadelphia, Penn.—Foreign shipments of coal from here during July showed an increase of more than 50,000 tons over the same month of last year, according to the monthly report of the statistician of the Commissioner of Navigation. His report showed that during the last month 171,127 tons of anthracite and bituminous coal were exported, as compared with 59,855 tons during July, 1914. Shipments of coal to coastwise ports during the month amounted to 259,788 tons, as against 266,270 tons in the corresponding month of last year.

Philadelphia, Penn.—The Philadelphia & Reading Coal & Iron Co. has libeled the steamship "Concord" of the Colonial Line for $70,000 damages. This sum the company claims represents the loss of the barge "Exeter" and the 2900 tons of anthracite with which the boat was loaded when struck and sunk by the steamer on July 31. The papers were served against the Concord while at her pier in Providence, R. I., and the owners were compelled to file a bond of $100,000 to procure the release of the boat in order to fulfill the regular sailing schedule to New York.

Denver, Colo.—A settlement has been effected by the Government with the American Smelting & Refining Co. in a case which has long been pending in the United States Court. The cash sum of $112,766 was paid to District Attorney Tedrow and forwarded to the Federal Government, being payment for coal actually taken from the mines at Aguilar and Cokedale, which are said to have been obtained from the Government through fraud. A total of 3475 acres of valuable coal land has also been returned from the company to the United States Government on the ground of having been obtained fraudulently.

Connellsville, Penn.—The Consolidated Connellsville Coke Co. recently shipped 5550 tons of furnace coke consigned to New York docks where it will be loaded for shipment to South America. Negotiations for the shipment of 40,000 tons of Connellsville coke are pending, and will probably be closed during the current month. The contract already shipped is the second consignment which the Consolidated Co. has handled in the past two months, the first cargo being 4500 tons sent in the early part of June. While the first cargo went to the Argentine, the present shipment is understood to be consigned to Chile.

Portland, Me.—President W. L. Connell, of the Lackawanna Coal & Lumber Co., recently asked a group of bondholders to forego the interest for two years on their bonds, to extend the notes given for interest due last October, and also to contribute a six per cent. assessment on their stock. This meeting is one of a series that is being held all over the country where groups of bondholders are located, to counteract the projects of an element which does not hold with the plans of the present management. The outcome of such agitation President Connell pointed out might be a receivership and forced sale under the hammer. He contends that the property is the most valuable of its kind in the world.

Bismarck, N. D.—The state railroad commission recently heard arguments on the lignite coal rate case in this state. The various railroads interested in coal rates, as well as mine operators were in attendance. Attorneys for the Soo railroads presented evidence to show that the present rate which the operators claim is excessive is only reasonable. They presented a complete statement of all their business for 1914. Attorneys for the Northern Pacific also held the present rate to be reasonable and gave a brief outline of the effect of the recent supreme court decision on the railroad business. The railroads will submit further data to the commission before a decision on the lignite rate is returned. A comparison will be made with rates in other states, which will be submitted by the attorneys for the various roads.

Connellsville, Penn.—The H. C. Frick Coke Co. is instructing its firemen and boiler house attendants in the principles of economy and efficiency. The study classes of this company, which have been conducted for the past three years will hold a series of meetings throughout the plants of the Connellsville region to continue education along these lines. According to the plan which will probably be adopted, the boiler house men from four or five plants will meet at some central point, there to discuss boiler house problems and receive instruction in the economic use of fuel. Experienced fuel experts will meet with the men, giving short talks on the subject of fuel economy as well as conducting investigations into the question of better boiler house practice. I. C. Kelly, master mechanic of the company, and R. C. Lyon of Connellsville, will have charge of this work.

Philadelphia, Penn.—An interesting and well vouched for story is going the rounds of the bituminous trade here. It was all due to the efforts made on the part of some shippers to secure the coal trade of Italy since England has shut off all exports. One of the large Philadelphia shippers was particularly anxious to secure the contract for supplying one of the government railways in Italy and for that purpose paid a visit to Rome. On the very day he arrived he was caught in an immense throng surging toward the street and when he got to a position of vantage found it was the King's automobile that had caused the commotion. And alongside of Victor Emmanuel sat E. J. Berwind, of the Berwind-White Coal Mining Co., of Philadelphia. Mr. Berwind probably was not talking shop to the King at the time, yet the other Philadelphian concluded that anybody who expected to beat Mr. Berwind would have to be extra swift, so he came home at once.

Philadelphia, Penn.—An interesting fact disclosed in the annual statement of President Thomas was that the Lehigh Valley Coal Co. mined 258,205 tons of bituminous coal last year, being a slight increase over the previous year. This coal, of course, was not mined on the line of the Lehigh Valley R.R., as none of the socalled anthracite roads has direct access to bituminous mines. While the above is not a large tonnage, it is of interest when it is considered that with this exception no other large anthracite company has ever engaged in the mining of bituminous coal. About 15 years ago the late George F. Baer purchased a large bituminous property in Somerset County, which it was reported was to be reached by a line from Shippensburg. For some reason the projected line was never started and some years later the Reading company disposed of the holdings without ever having made an effort at development.

Coal Trade Reviews

General Review

Approach of fall season the only constructive feature in the anthracite situation. Slightly firmer tone in bituminous, though it is still a buyer's market. Exports continue to boom. Delayed buying at interior points expected to cause a congestion.

The approach of the fall season is the one constructive feature in the anthracite situation. It is evident that many long-deferred orders must be released shortly, but until this occurs no activity can be expected. At the moment only a rigid curtailment, particularly among the individual operators, has saved a general demoralization. The large demurrage bills, against even some of the big companies, is tangible evidence of how unusually dull the anthracite market has been. The better grade steam sizes are moving more freely and, while concessions by the individuals are still the rule, there is apparently not so much of this coal being placed. Some inquiries for anthracite exports are developing. The Lake shipments show a further increase, and the docks are more active than for a long time. At interior points like Ohio hard coal is being absorbed better than in previous years.

Eastern bituminous buyers are still proceeding cautiously, and the trade continues marking time, though consumers are possibly showing less disposition to hold out for bottom prices. However, it is distinctly a buyers' market. Occasional tonnages are still going at sacrifice prices, in order to avoid demurrage, and as liberal inducements can be obtained as at any time this season. Consumption and demand at line points are apparently better than at Tidewater.

The new British regulations, restricting exports still further, have stimulated renewed interest in the foreign business. In spite of the general tendency to belittle this business, it is clear that it is proving a potent factor in relieving the pressure in certain quarters. There has been another spurt in the demand for high-grade coal for export, and the volume now moving in this direction is sufficient to hold prices fairly even. Evidence of the heavy shipping is noted in the situation at Hampton Roads, where some companies continue having difficulty in getting coal forward fast enough to meet their obligations. The increased demand for grain steamers has stiffened rates in the off-shore trade, while coastwise vessels continue sensitive to the fluctuating demand for coal, some unusually high figures being noted.

There is a slightly heavier demand in the Pittsburgh district, but there is plenty of free coal still available, and quotations have not as yet been affected. While it cannot be said that there has been a positive turn for the better, the heavy operations at the steel mills are undoubtedly creating a better sentiment, and the operators are taking a somewhat different view as regards contract prices. Slack coal is notably stronger.

The improvement in the Ohio situation continues, although it is not very extensive, and buying continues conservative. The increase appears to be general in all directions; domestic demand is larger, while requisitions from manufacturing plants are increasing and the railroads are taking a greater tonnage in order to handle the heavier traffic. The unusually large crops have had a notably stimulating effect on the business outlook. The extremely light Lake movement continues the one acutely depressing factor in the situation. The unusually low prices recently in effect have apparently been wiped out.

Buying in the Middle West has been so generally delayed in all directions that there is danger of a serious congestion when the crops and coal start moving together, as must be the case very shortly; it is well established that stocks are small throughout the country districts, and when the buying opens up there will be a rush for coal. The heavy rainfalls over the early part of the month had a tendency to delay harvesting and seriously interrupted deliveries in the country districts. The rapid improvement in the iron and steel industries has been one of the most impelling constructive factors in the current situation.

A Year Ago—Business uncertainty has created a sharp buying movement in anthracite. Derangement in coastwise and foreign shipping has seriously disturbed the Eastern bituminous situation. Producers aggressively investigating the possibilities in the foreign markets. Sentiment generally better.

BUSINESS OPINIONS

Boston News Bureau—At the moment much of the good news has come out. The latest, the decision of the Interstate Commerce Commission in the Western railroad case, gives many increases, but not in every instance. The further heavy influx of gold from England is a feature. It is an encouraging sign to see England shipping gold here rather than establishing a credit. If she continues this policy she will gain prestige the world over. The situation is still one that puzzles the brightest. Conservative men are extremely conservative. They are not inclined to make large commitments and yet they are not loud in protest.

Iron Age—Active buying at advancing prices has centered attention on the pig-iron market. Steel-making pig iron has led in tonnage and has advanced $1 a ton in nearly all markets except Chicago. Thus the heavy demand for openhearth steel which caused so abrupt a rise in billets is now also the dominant factor in pig iron. Some excitement has been added to the situation by a reported purchase of pig iron at Cleveland by the Steel Corporation, but confirmation of this report is lacking.

American Wool and Cotton Reporter—It was a comparatively big week in the Boston wool market, with sales of 6,310,000 lb. More medium wools were sold than for the previous week. Prices are a shade firmer. That the market is in for a period of high value is the feeling practically throughout the trade. Trading seems to be pretty general on both domestic and foreign wool. There has been some speculation in noils in anticipation of army contracts.

The Government Crop Report—The Government crop report as of Aug. 1 is highly encouraging. The estimated production of corn, wheat and oats is placed at 5,286,000,000 bu., which compares with previous years as follows: 4,704,000,000 bu. in 1914; 4,331,000,000 bu. in 1913; 5,272,000,000 bu. in 1912 and 4,074,000,000 bu. in 1911. The production for the current year is 15% ahead of the average for the four preceding years and is worth approximately a half a billion dollars more than the average for the past three years. With the Dardanelles closed against Russian export the demand for our grain will also be of such proportion as to assure a very satisfactory price.

Duns—Commercial progress would be more uniform were it not for the vagaries of the weather, especially in the East. Confidence, however, is not shaken by influences of a temporary nature, and apart from these handicaps, developments continue mainly on the constructive side. Rarely have fundamental conditions been as sound as at present, and knowledge of this fact leads to the conviction that nothing is likely to permanently check the revival of general business activity. More shoe factories are running close to capacity and there is a noticeable revival in the wool industry.

The Southern Lumberman—Reports from the several yellow pine manufacturing territories and from the consuming markets are more uniform and more optimistic this week than at any time within the past two months. Stocks at the mills and on yards of both wholesalers and retail dealers are to some extent broken. The volume of hardwood business for July, while not what might have been desired, was nevertheless fairly satisfactory.

Marshall Field & Co.—The month of August has started with a substantial gain in shipments as compared with those of a year ago. The "market week" and "style show" brought a large attendance of buyers from all sections of the country. Weather conditions have been decidedly unfavorable to retail selling. Collections are good.

Bradstreets—Basic conditions continue to improve and feeling as to the future is more optimistic, but withal, conservatism, born of uncertainty as to results likely to follow a wet harvest, with some toning down of earlier exuberant crop estimates, is quite marked in grain-raising sections. So, on the one hand, country buyers are inclined to be cautious, while on the other, those hailing from metal manufacturing centers are more set upon going ahead.

ATLANTIC SEABOARD

BOSTON

Market very dull and receipts are being applied almost exclusively to contracts. Buyers recognize this as a favorable time to secure concessions. Georges Creek and Pennsylvania grades unchanged. Water freights variable. Anthracite business fair.

Bituminous—The Pocahontas and New River market is almost featureless. While the volume of coal moving off-shore is still large and is sufficient to hold prices fairly even there is almost no demand coastwise. There are perhaps fewer concessions heard than a fortnight ago, but that is due not so much to any firmer tendency as to the fact that shippers realize that even low prices will not stir up new business of any account. Receipts have been extremely light on account of the continued thick weather but now that cargoes are arriving it is seen that practically all are being applied to contracts.

Only a few orders are hanging fire and what buyers are in the market are proceeding very cautiously. Right now is probably as favorable a time as any this season for buyers to secure liberal inducements from most of the agencies. A few of the shippers with long established connections abroad did practically a normal business in July.

The abundant supply of water is a factor in the August dullness that prevails in New England. Many industrial plants will go light on coal for several weeks to come.

There is little news on Georges Creek. Loading for export has taken a spurt at Baltimore but otherwise the situation with the shippers is about normal for the season. There is no longer any difficulty about effecting prompt shipment.

The houses which handle the Pennsylvania grades are watching this market very closely with a view now to next year. There is an increasing disposition on the part of buyers to look into the merits of high-grade coals from the Pennsylvania districts and unless the present differential with Southern coals is reduced there is likely to be an expanding business in this direction another year.

Water Freights from Hampton Roads to Boston are quite sensitive to the fluctuating demand for coal. Sailing vessels are scarcely heard from except in the case of small coasters loading at New York, and barges and steamers are carrying practically all the coal; 75c. to Boston is quoted as the market on bottoms 2500 tons upwards; $1.25@1.50 has been paid on 500-ton vessels, New York to Calais and Eastport, Me., an unusually high rate.

Anthracite—The larger companies have a better supply of orders than was anticipated. Shipments are made promptly but there is enough business so that anthracite-carrying barges are not so easy to secure for bituminous loading. Individual shippers are still offering material concessions but very little of such coal has been placed here. Retailers are making exertions to get customers to accept deliveries now in order to relieve the congestion that is usual in the early fall.

Quotations on bituminous at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$0.85@1.40	$1.15@1.60	$1.67@1.77	
Philadelphia*	2.10@2.65	2.40@2.85	2.92@3.02	
New York*	2.40@2.95	2.70@3.15	3.22@3.32	
Baltimore*	.....	.....	2.85@2.95	
Hampton Roads*	.....	.....	.....	$2.65@2.80
Boston†	.....	.....	.....	3.50@3.63
Providence†	.....	.....	.....	3.45@3.68

* F.o.b. †On cars.

NEW YORK

Some cheap bargains in bituminous. Export business continues large but bunkering is slowing up. Anthracite season advancing. Prices still rule substantially below the circular.

Bituminous—Opportunities favorable to the consumer continue to offer themselves through the agency of demurrage coal. Some cargoes have been sacrificed in order to escape further losses by car demurrage. There are generally times throughout the year in the bituminous market when this is true so that the condition is not a new one. The bunkering tonnage has naturally fallen off here and with mining continuing, even if on short time, some place must be found for the coal.

Fortunately the export orders have come to the rescue and while a great deal is said about the bluff of this business it is nevertheless a fact that quantities of coal have been shipped to the belligerent nations and South American countries. It may be said that better prices are being obtained on this class of business than on the regular local contract supplies. The open market quotations prove too strong a temptation for the average consumer to overlook. Line bituminous out of New York is holding up well. The holders of contracts there seem to be scrupulous and their draughts on their allottments are normal.

Current quotations are on the following basis:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.30@3.40	$3.30@3.40	$3.30@3.40	$1.75@1.85
Georges Creek Tyson	2.90@3.00	2.90@3.00	2.90@3.00	1.35@1.45
Clearfield:				
Medium	2.65@2.80	2.55@2.65	.....	1.10@1.25
Ordinary	2.55@2.60	2.55@2.60	.....	1.00@1.10
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks	2.90@3.05	.....	.....	1.35@1.50
Nanty Glo	2.75@2.80	.....	.....	1.20@1.25
Barnesboro	2.65@2.70	.....	.....	1.10@1.15
Somerset County:				
Quemahoning	.....	2.70@2.85	2.70@2.85	1.20@1.30
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe	2.45@2.55	.....	.....	.90@1.00
Greensburg	2.75@2.80	.....	.....	1.10@1.15
Westmoreland	3.15@3.29	.....	.....	1.35@1.45
West Virginia Fairmont		2.60@2.70	2.60@2.70	.80@ .90
Fairmont mine-run		2.50@2.60	2.50@2.60	.76@ .80
Steam		2.45@2.50	2.45@2.50	.90@ .95
Western Maryland		2.35@2.40	2.35@2.40	.80@ .85

Anthracite—There remain but a few weeks more before there will be an evident stimulation in the market. With August half over this much needed change cannot be further away than the week following Labor Day. There are orders on the books of the retailers, some of which date back to April, which will surely have to be filled in September. When these orders are received the retailers will begin to buy but not until then.

Mining operations have been limited to two or three days each week at most of the collieries. This is also true of some of the individuals. Lake shipments require the bulk of the prepared sizes now being produced and it is noted that each week's lake report shows a very satisfactory tonnage. Conversely the New York market absorbs the steam sizes, especially rice and barley. The better grades of these coals are in strong demand and prompt loading is out of the question. This situation will clear a little when full mining is resumed but the prospects are that there will be no over-abundance during the entire winter.

Pea coal is a drug at the present and is going into stock. There is no large accumulation of domestic sizes at the loading ports and there is little local demand, yet prices have held well. In some cases chestnut has sold lower than either stove or egg. Of the three stove may be said to be the leader.

Export inquiries calling for broken and steamboat coal receive little attention. The broken output is being absorbed on gas-house and manufacturing contracts and steamboat is unprofitable to produce.

Following are the average quotations af the week:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$4.95		$5.00	
Egg	5.20	$4.70@5.20	5.25	$4.75@5.25
Stove	5.20	4.90@5.20	5.25	4.75@5.25
Chestnut	5.45	4.85@5.45	5.50	5.05@5.50
Pea	3.50	2.70@2.95	3.50	2.75@3.00
Buckwheat	2.75	2.00@2.25	2.80	2.05@2.30
Rice	2.25	1.70@1.85	2.30	1.75@1.90
Barley	1.75	1.45@1.70	1.80	1.50@1.75

PHILADELPHIA

Anthracite continues dull, although some sizes are stronger. Cheap coals not so active, and pea shows slight tendency to tighten. Collections extremely poor. Bituminous quiet, but slack somewhat scarce. Exports continue to increase.

Anthracite—While the shutting down of the collieries, especially those of the individuals, is all that has kept the trade from being thoroughly demoralized for the past three or four weeks, this cessation of mining is being felt and there is probably less very cheap coal in the market than for some time, excepting chestnut, sales of even the smallest quantity of this still being reported at the April price. We know of one recent sale of 1200 tons of stove and 1900 tons of chestnut at April rates, the latter size making the order attractive; shipments on this order are to be made at the seller's convenience.

Broken and the steam sizes are being absorbed, while egg and stove are still causing little trouble, especially as it is reported that shipments to the New England market are improving. The pea coal situation is progressing rather favorably, although the individuals show little disposition to allow the large companies to secure the business at their price of $2 and tax. The former's price has advanced 10 or 15c. per ton in many instances, but is the same amount off what is now practically accepted as circular—the $2 rate. One of

the reasons for the slightly improved business is the amount of coal being bought by various institutions in and around Philadelphia. This seems to be the season for laying in their supply.

The demurrage bills are coming in from the railroads for cars that were held at the scales pending disposition, and the shippers realize more than ever just what a dull siege they have been going through. While the smaller operators have been great sufferers in this respect, it is known that at least one of the largest companies has been penalized thousands of dollars. There are no "free lists" these days.

It is understood that considerable coal is being stored at Port Richmond piers for reconsignment when business braces up. This costs the shippers 5c. per ton to dump, 10c. per ton to pick up and 1c. per ton per month for storage.

Collections remain poor and probably will continue so until fall. A careful canvass of the trade shows that few can boast of any improvement. The circular prices, to which the state tax of 2½c. per ton should be added, are as follows:

	Line	Tide		Line	Tide
Broken	$3.40	$4.65	Pea	$2.50	$3.25
Egg	3.65	4.90	Buckwheat	1.25	2.25
Stove	3.90	4.90	Rice	.85	1.75
Chestnut	4.05	5.15	Barley	.50	1.50

Bituminous—The only noticeable feature of the market the past week was the tightening of slack coals. This was probably due to lack of demand for the three-quarter sizes and as a consequence had a tendency to raise the price of slack from five to ten cents a ton. Outside of this slight stir the market still seems to be marking time, although some quarters report a continuation of the increase in tonnage noted last week.

The trade is now looking toward fall when a real boost is expected. In the meanwhile the export business continues in increasing volume, especially so since the British Government has issued its Orders in Council prohibiting any exports at all effective Sept. 1, and the inquiries are now coming in, in greater numbers than usual. In this work the Government itself is assisting to some extent through our consular agents abroad, whose reports are printed and forwarded to the various mining interests. There is hardly an American consul who does not weekly report of opportunities to secure coal business.

The Commissioners of Navigation in their monthly report announce the shipment of 171,127 tons of bituminous coal to foreign shores as compared with 59,855 tons last year. Shipments to coastwise points amounted to 259,788 tons as against 266,270 tons in July of last year.

The current prices are as follows:

Georges Creek Big Vein	$1.65@1.75	Fairmont gas, mine-run	$1.15@1.25
South Fork Miller Vein	1.50@1.60	Fairmont gas, slack	.70@ .80
Clearfield (ordinary)	1.00@1.20	Fairmont lump, ordinary	.85@ .95
Somerset (ordinary)	1.00@1.15	Fairmont mine-run	.75@ .80
West Va. Freeport	.85@ .95	Fairmont slack	50@ .60

BALTIMORE

A slow improvement noted here. Export movement holds good. Anthracite dealers pushing in delayed deliveries.

There can no longer be a doubt but that business conditions are improving. There is a better line of inquiry, less haggling for bottom prices, and an increasing demand on contracts. There is still much to be desired but there is a decidedly better tone.

The remarkable export movement holds up in good shape. During July a total of 251,485 tons was loaded as cargo coal for foreign ports. For the first six workings days of August a total of 54,856 tons was put in foreign bottoms as cargo fuel, in addition to 7010 for bunker use. Prospects are that August or September will exceed July movement, the banner month, when 309,000 tons was sent out on export.

Anthracite men are showing more life and some fair orders are coming in mainly for early fall delivery. In the meantime that part of the trade is pushing in delayed deliveries wherever the opportunity offers so as to be free for the fall rush.

HAMPTON ROADS

Export shipments to Italy continue heavy. Coastwise movement fair. No change in prices. Dumpings for month of July reach the enormous figure of 1,562,330 tons, breaking all former records.

The movement from Tidewater piers during the week has not been as heavy as expected but there have been a number of large cargoes loaded for both coastwise and foreign ports. There is practically no change in prices although the demand continues heavy for export coal. The accumulation on the railroad yards is still somewhat light and a number of the shippers are having difficulty getting coal forward fast enough to take care of vessels promptly on arrival.

With the total dumping of the three piers at Hampton Roads amounting to 1,562,330 tons for the month of July, all previous records for heavy dumpings were broken. These figures are about 125,000 tons above those for June, which was the record month. As is usually the case the Norfolk & Western Ry. dumped more coal than the other two roads combined and while both the Chesapeake & Ohio and the Virginian showed an increase over their June figures the Norfolk & Western showed a slight decrease. The movement over the Norfolk & Western piers amounted to 825,910 tons, the Virginian 300,190 tons and the Chesapeake & Ohio 436,230 tons. Of the total July movement the largest percentage of the export coal was taken by Italy, a greater part of this coal being for the railways and navy.

Railroad Tonnages—Dumpings over the local piers for the past several weeks compare as follows:

Railroad	Week Ending Aug. 7	July 10	July 17	July 24	July 31
Norfolk & Western	135,357	174,822	180,090	197,913	188,593
Chesapeake & Ohio	110,861	76,397	116,862	96,627	84,018
Virginian	64,397	57,467	78,710	86,523	39,335
Totals	310,515	308,686	375,662	381,063	311,949

OCEAN FREIGHTS

Plate freights are practically the same as a week ago and a number of charters were effected during this interval at or about recent quotations. Mediterranean freights are firmer owing to the increased demand for steamers for grain; Cuban and West Indian freights are also firmer on account of the scarcity of tonnage available for this business.

The freight market is now quotable as follows:

To	Rate	To	Rate
Havana	$2 75@3 25	Bermuda	**$3.00**
Cardenas or Sagua	3.00@3.50	Vera Cruz	3.25@3.75
Cienfuegos	3.25@3.50	Tampico	3.25@3.75
Port au Spain, Trinidad	3.50	Rio	8.40@8.64
St. Lucia	3.25@3.50	Santos*	8.40@8.88
St. Thomas	3.00	Montevideo	8.16
Barbados	3.50	Buenos Aires or La Plata†	8.16@8.24
Kingston	3.00@3.50	Rosario	8.40@8.64
Curacao	3.25	West Coast of Italy	9.36@9.60
Santiago	3.25@3.50	Barcelona**	8.64@8.88
Guantanamo	3.25@3.50	Valparaiso or Callao	6.50@7.00
Demerara	4.50@5.00	Marseilles	8.88@9.12

Note—Rates noted in **bold face** type are only approximate.
* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers. Neutral steamers are more difficult to obtain and the rates are always higher. Neutral owners prefer Buenos Aires.
W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge. 24c. per net register ton per day demurrage."

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
Rosebank	Valencia	2470	
Nordland	Cardenas	1042	
G. E. Klinck	Eastport	460	$1.35
Geo. Pyman	Barcelona	2508	
E. E. Briny	Fort de France	1408	
Theenline	Cay Francis	850	
A. B. Mitchell	Portsmouth, N. H.	397	.90
A. J. Trainer	St. John, N. B.	336	
Orkild	Cuba	1622	
Glenmount	Cuba	1246	

BALTIMORE

Vessel	To	Tons	Rate
Titania	Italy	2173	
Antwerpen	Denmark	1026	
Siljerstad[1]	River Plate	2680	$8.22
Corby[1]	River Plate	2279	8.22
Falk[2]	Santa Marta	1125	
Llongwen	Italy	3013	9.12
M. Med't'r.	Spain	1939	
Northmount	Havana	1172	
J. A. Hooper	San Diego	1321	

BALTIMORE

Vessel	To	Tons	Rate
Ruth	Tampa	2423	
Commonwealth[1]	River Plate	2183	8.28
Camlake[1]	Italy	2086	8.64
St. Andrew	Sweden	3500	

[1] Or Virginia. [2] Colombia.

VIRGINIA (Including Hampton Roads)

Vessel	To	Tons	Rate
S. Palmer	Lisbon	2357	
Lexie	Montevideo	2375	$8.16
Siljerstad[1]	River Plate	2680	8.22
Corby[1]	River Plate	2279	8.22
Tancred	St. Lucia	2231	
Skogland	Colon	1898	
Commonwealth[1]	River Plate	2183	8.28
Camlake[1]	Itly	2086	8.64

[1] Or Baltimore

ATLANTIC RANGE

Vessel	To	Tons	Rate
Orion	Italy	2081	$.12
Nikolaos	Marseilles	2777	8.88
G. E. Dudley	Halifax	387	1.90

Note—Steamers are indicated by **bold face type,** all others being schooners.

VESSEL CLEARANCES

The following steamers have cleared from Hampton Roads July 30 to Aug. 6:

NORFOLK

Vessel	Destination	Tons
Alcana[1]	Puerto Plata, A. R.	5012
Weiringen[2]	Buenos Aires	4193
Skogstad	Canal Zone	5600
Elio	Genoa	4750
E. Starr Jones	Pernambuco	1270
Goulandris	Maddalena	5140
Affinita	Maddalena	197
Ulysses	Canal Zone	12,000
Chas. A. Campbell	Para	2142
Tabor	Canal Zone	5500
Andriana	Buenos Aires	4160
Celia	Coronel	800

NORFOLK

Vessel	Destination	Tons
Hermod	Bridgetown	5000
Fortunata	Bagnoli	3700
Chas. G. Endicott	Maranham	1040

NEWPORT NEWS

Vessel	Destination	Tons
Boniface	Para	1038
Berwindmoor	Spezia	7100
Vulcano	Genoa	7300
Nea Hellas	Piraeus	5600
Tancred	Port Castries	5500

[1] Smokeless Fuel Co. [2] W. Va. Coal Co.

LAKE MARKETS

PITTSBURGH

Demand slightly increased and sentiment decidedly better, with contract prices a shade stiffer. Operations at 50 to 60% of capacity.

There has been a slightly heavier demand for coal, in the aggregate, but there is still plenty of free coal in the market and prices for prompt shipment are not sensibly advanced. The consumption of the steel trade is large and has increased somewhat even in the past week, while as the mills get into smoother running order and approach the cold weather it is likely the coal consumption of the industry will pass all records.

General business shows an improvement, and the local coal trade has become decidedly more hopeful as to the future, and somewhat stiffer in its views as to contract prices. The lake movement continues light and it is now doubted whether there will be any substantial increase in the rate of shipping at any time in the remainder of the season. The Pittsburgh district continues to turn out coal at between 50 and 60% of capacity. The demand on the Connellsville district for export coal is about the same as formerly.

Pittsburgh district prices for prompt coal remain substantially as follows: Slack, 50@55c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1@1.05; ¾-in., $1.10@1.15; 1¼-in., $1.20@1.25, per net ton at mine, Pittsburgh district. On contract to Apr. 1 mine-run is $1.05@1.15 and slack about 95c.

BUFFALO

Bituminous improving very slowly. No improvement in sight in anthracite. Some promised near the end of the month.

Bituminous—There is a steady increase in the demand, but it comes slow. The fall trade is expected to be good, though the promise is not very positive yet. Some of the Allegheny Valley operators are now running half time and others are complaining of unsold coal on track. The shippers agree that the demand comes in strong some days and then drops off almost entirely. There are a good many iron furnaces, some of them idle for years, that are starting up and they will force a general activity if they go on.

There is a perceptible improvement in the slack market. This was occasionally selling as low as 30c. a ton awhile ago, and now it sometimes brings 75c. This means that the very low figure is gone and will not return unless the market weakens again. Bituminous is still quotable at $2.70 for best Pittsburgh lump, $2.55 for three-quarter, $2.45 for mine-run and $2.25 for slack. Allegheny Valley sizes are 25c. below Pittsburgh. The slack has not been quite as strong lately as Pittsburgh slack, but it is reckoned on a par with it in price generally.

Anthracite—At present the Upper-Lake docks are not eager for cargoes, but the shippers are putting them in wherever they find room. The amount loaded here for the week again shows an increase, being 122,850 tons, which is a fair amount for midsummer. Some of the shipping docks are more active than they have been for a long time. It will be sometime before the city anthracite trade is active. Dealers have turned their attention to other business so far as possible and will let the trade take care of itself till fall.

COLUMBUS

Trade shows a little more activity in both domestic and steam lines. More stocking and retailers are buying to take care of the demand. Prices unchanged.

A slight improvement is reported during the past week. This is especially so in domestic circles where trade is increasing in volume. The tone of the market appears to be better all along the line and coal men generally believe that future prospects are brighter.

In steam lines there is also an improvement as manufacturing is growing better. Requisitions for manufacturing plants are larger and there is a tendency among purchasing agents to increase stocks. Railroads are taking a fair amount of fuel as the freight movement is increasing. Buying off the open market is still a rule in certain sections but some of the consumers are now showing a disposition to contract though only a few contracts are expiring. One of the best features is the absence of extremely low prices as was the case several months ago.

Threshing in rural sections is now at its height which means a large consumption of coal. Rural dealers have been hurrying up orders as they are selling more coal than usual. The wheat and oats harvests are unusually big.

Many of the larger domestic consumers in the cities are laying in their winter's supply of fuel and retail trade is active. There is a better demand because of the failure of natural gas in previous winters and householders are returning more and more to the use of coal.

The Lake trade is not very active as there is still a large quantity on the docks at the upper ports. The movement to the interior is slow. Many of the larger Lake producers are not taking any part in the trade as they do not wish to invest any more money.

The anthracite trade is more active in central Ohio territory. Many of the shippers report an increase of fully 50% in the demand as compared with previous seasons. This is especially true of certain residence sections of the larger cities.

Prices in the Ohio fields are as follows:

	Hocking	Pomeroy	Kanawha	Eastern Ohio
Rescreened lump	$1.45	$1.50		
Inch and a quarter	1.35	1.35	$1.30	$1.25
Three-quarter inch	1.25	1.25	1.25	
Nut	1.15	1.25	1.15	
Mine-run	1.05	1.10	1.05	1.00
Nut, pea and slack	.65	.70	.65	.60
Coarse slack	.55	.60	.55	.50

Mines have been working at about the following percentages of full capacity:

District	Week Ended July 17	July 24	July 31	Aug. 7	District	Week Ended July 17	July 24	July 31	Aug. 7
Hocking	25	25	15	25	Cambridge	35	25	30	30
Jackson	25	20	20	20	Masillon	30	25	25	25
Pomeroy	40	40	35	25	Eastern O.	50	55	50	30
Crooksville	20	20	20	30	Average	32	30	29	30

TOLEDO

Both steam and domestic markets slightly better. Crops injured by heavy rains.

The general improvement in the demand for coal continues though it is not extensive. The steam trade is showing some awakening although buying is very conservative. Many large concerns continue picking up bargain coal. There has been no indication here of any congestion nor does there seem to be any possibility of such a contingency. The heavy rains of the past two weeks has affected the crops noticeably.

The Lake movement is lighter than it was and it has at no time this season been up to normal. Pocahontas coal is still in good demand but it is claimed that there is some shading of the increased August prices.

CINCINNATI

Domestic business slightly improved, although buying is still in small volume. Steam demand dull.

While the movement of the prepared grades is not up to normal, there has been a slight increase during the past week. Poor credit conditions among domestic consumers are probably responsible in part for slow buying by retailers, but stocks are so low that there must be a steady increase in buying from this quarter. The Lake trade is lagging behind normal. The improved domestic situation has not helped the domestic market and the additional screenings have been difficult to place. Consumption among manufacturers in this section is not what it should be.

LOUISVILLE

Slight activity due to some delayed buying. Prices firmer, though no higher.

A considerable improvement is noted in the Kentucky field, though principally as to the volume of business done rather than in prices. This is the natural increase which could not well be delayed longer and which in normal years is closed up before now.

Prices continue virtually unchanged, block ranging from $1.25 to $2, according to quality, etc., though it is said that there is more being sold on the higher levels than heretofore. Nut and slack is showing no variation of note.

COKE

CONNELLSVILLE

Prompt furnace coke has slumped further and contract quotations have become nominal. Iron and steel conditions improved, but Connellsville coke market evidently affected by continued erection of byproduct ovens. Production and shipments increased.

The general tone of the coke market has softened further. The surplus stocks already mentioned have not been dissipated by a decrease in production, as was expected would

occur, and prompt furnace coke has been a drug on the market, being freely offered at $1.50 while it is possible that even this price has been shaded in some instances. Nominal asking prices on contract furnace coke are unchanged, but there has been no serious test as inquiry has amounted to practically nothing.

The operators are still convinced that there will be a heavy demand later, and fancy prices by the close of the year, based on the increasingly favorable developments in the iron and steel markets, but they have been expecting an improvement in coke for a long time without encountering tangible results. It is certainly anomalous that Connellsville coke should remain so low, when the steel mills are operating practically at capacity, and a firm pig-iron market has turned in the past fortnight into a sharply advancing one.

The only explanation is that byproduct coke has entered the situation so largely as to make it improbable, in the minds of buyers, that Connellsville coke can become scarce. Corrigan, McKinney & Co. last week signed a contract for 200 Koppers byproduct ovens, to be erected as rapidly as possible at the firm's site in Cleveland, where two merchant furnaces are in operation and two more, with a steel plant, are under construction, to be finished early in the new year. The 200 ovens are to supply all four of the blast furnaces.

The Connellsville coke market stands as follows, contract furnace quotations being practically nominal: Prompt furnace, $1.50; contract furnace to Oct. 1, $1.75; to Jan. 1, $1.85@2; prompt foundry, $2.20@2.40; contract foundry, $2.25@2.60, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended July 31 at 377,410 tons, an increase of 10,315 tons, and shipments at 373,182 tons, an increase of 12,230 tons.

Buffalo—There is a continuation of the good feeling in the trade, backed by many reports of a genuine stir in iron and steel. If this continues there will be as much coke called for as the ovens will want to turn out and prices will be firm. The price is advancing and nothing of fair quality can now be had at former quotations. The basis is best 72-hr. Connellsville at $4.30, with stock coke $3.35.

Chicago—Gas house coke is quiet, but byproduct egg, stove and nut have been in steady demand at good prices. Foundry coke has assumed a more determined stand, and prices are well maintained. Quotations are as follows: Byproduct, $4.65@5.10; Connellsville, $4.75; Wise County, $4.65@4.75; gas coke, $3.75@3.90, furnace, $4.85.

MIDDLE WESTERN

GENERAL REVIEW

Western situation quiet and shipments delayed by rainy weather. Confidence expressed in immediate future. Smokeless coals still virile. Western steam sizes slow. Anthracite dull.

The midsummer demand has not bettered this week. Continuous rainfalls are proving detrimental to a normal absorption of tonnage and have delayed threshing. Roads in the country districts are in such a condition that hauling cannot be done. About three weeks of hot dry weather is now needed. The backwardness of harvesting in the northwest is also causing delayed movement to that section.

But despite adverse weather conditions, there is some improvement on a small scale. Steel and manufacturing plants which take a considerable amount of coal are showing more activity; many steel plants in this territory are now operating to capacity, and allied manufacturing lines are showing sympathetic improvement. Evidently heavy movement of both grain and coal will occur simultaneously this year, and this may cause a serious congestion. The steam trade, however, is still behind the domestic.

The Chicago market is absolutely bare of consignment coal, which shows a healthy state of affairs. Screenings are if anything lower than last week, averaging between 65c. and 70c., with some shipments made at 60c. It is felt that the improvement shown in the industrial situation and settlement of building trade strikes in Chicago, will serve to strengthen the screenings market very shortly. An advance in the prices of domestic sizes became effective with many operators Aug. 1.

An increase is noted in the number of small orders which seems to indicate awakening interest on the part of the little consumer. In view of the general draggy conditions this summer, prices have remained remarkably steady. Although the demand is quiet, it is well established that there are very small stocks throughout the country districts, and as soon as the buying season once gets in full swing, there can hardly be any question but that the market will improve quickly.

CHICAGO

Price advances have little effect. Indiana grades especially slow. Anthracite heavy and no decision expected on the new rates for some time.

The marking up of 10c. per ton on Southern Illinois coarse sizes effective Aug. 1 has had but little apparent effect as yet. Carterville operators are also asking $1.60 for lump and egg, and $1.65 for No. 1 washed, while most of the operators in Williamson County are seeking to obtain $1.50, with a good many shipments going forward at from $1.35 to $1.40. Screenings are ranging around 65c. to 70c., and if fine coal continues downward, many Southern Illinois operators will probably store screenings on the ground pending a better outlook. The Saline County mines are running about half time, with no change in prices, and domestic shipments are rather slow.

No changes have been announced in Springfield district prices. Railroad tonnage for these mines has been somewhat below the minimum the last two weeks. Domestic lump shipments have been very slow, but screenings have gone forward in steady volume at prices ranging around 60 to 70c.

The demand for Indiana coal in this market is below normal and less shipments are going to Northwestern points. It was expected that there would be a revival of buying early in August, but it has not appeared. Domestic buying is slow, and the dealers have shown no tendency to place storage orders of any consequence as yet.

Pocahontas and New River smokeless coals are still very strong and active, although sales agents expected a lull in the demand. Lump and egg are firm at $2.25, and mine-run, $1.40. Splint is firmer.

Pennsylvania smokeless is being sold freely at July prices, but it is rumored a new circular will shortly be issued raising quotations.

Hocking lump is moving very slowly. There is a large tonnage of these coals at upper lake ports. Prices are fairly well maintained in the face of the adverse conditions.

The keen competition for tonnage by the Kentucky shippers causes sales at most any price, and the situation still continues unhealthy. Lump coal is sold all the way from $1.25 to $1.90, but the range is not so wide on other sizes.

It is said that the Interstate Commerce Commission will not make a decision as to the reasonableness of the 25c. advance in anthracite rates to Chicago until the case of the general anthracite rates and practices has been made public. Anthracite is very slow, and all-rail shippers to Chicago are absorbing the 25c. advance in freight rates, making no change in Chicago delivered prices, in order to compete with the docks. Buying at the end of July was of little moment, but there are some reports to the effect that the middle of August will see a considerable number of orders placed from the Chicago district and Illinois points. Many inquiries have been made of wholesalers here regarding the effect the rate advance would have on prices, and asking for advice as to whether or not stocking should be done in August.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.50@1.60	$1.35@1.50	$1.35@1.50	$1.25@1.50	$1.40@1.50
Steam lump	....	1.25	1.15@1.30	1.15@1.25	1.15@1.25
2½ and 3-in. lump	1.25@1.35	....	1.25@1.35	1.25@1.35	1.25@1.35
1¼-in. lump	....	1.25	1.15@1.25	1.15@1.25	....
Egg	1.50@1.60	1.35@1.50	1.15@1.25	1.10@1.15	1.10@1.25
Nut	1.40@1.50	1.25@1.35	.95@1.10	.90@1.10	1.00@1.10
No. 1 washed	1.40@1.50	....	1.45@1.50	....	....
No. 2 washed	1.25@1.35	....	1.35@1.45	....	....
No. 1 nut	1.50@1.60	....	....	....	....
No. 2 nut	1.40@1.50	....	....	....	....
Mine-run	1.10	1.05@1.10	.85@ .95	.85@1.00	.85@1.05
Screenings	.60@ .70	.65@ .75	.60@ .75	.65@ .70	.65@ .75

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.35@1.50	$1.25@1.90	≥2 25	$1.75@2.00	$1.40@1.60
1¼-in. lump	1.15@1.25	1.25@1.35	....	1.25@1.50	1.25@1.35
Egg	1.35@1.50	1.15@1.35	2.25	1.25@1.35	1.00@1.10
Nut	....	.90@1.10	1.75	....	....
No. 1 nut	1.25@1.35	....	....	....	....
No. 2 nut	1.25@1.35	....	....	....	....
Mine-run	1.10	.90@1.15	1.25@1.45	1.25@1.35	.90@1.05
Screenings	.60@ .70	.50@ .70	....	....	....

West Va. Splint 3 and 4-in lump, $1.25@1.35; 1¼-in lump, $1.15@1.20.

Lake Receipts—Receipts by Lake for the week ended Aug. 10 and for the season, this year and last year, were as follows:

	1915		1914	
	Hard	Soft	Hard	Soft
Buffalo	13,097	8,771	30,486	.....
Oswego	5,402	.....	4,600	.....
Cleveland	.....	10,029	.....	6,448
Ashtabula	9,050	16,831	.....	.....
Toledo	.....	1,615	.....	9,450
Sandusky	.....	9,137	.....	10,231
Week's total	27,549	46,383	35,086	26,129
August total	27,549	55,388	55,632	31,429
Season total	406,948	282,628	357,344	367,737

PRODUCTION AND TRANSPORTATION STATISTICS

ANTHRACITE SHIPMENTS

Anthracite shipments for July and the first seven months of 1914-15 were as follows:

	July		7 Months	
	1915	1914	1915	1914
Phila. & Reading	839,554	831,965	6,252,825	6,863,613
Lehigh Valley	1,024,611	1,026,225	7,324,459	7,181,300
Cent. R.R. of N.J.	597,992	708,891	4,396,841	5,097,978
Del. Lack. & West	542,775	826,771	5,111,383	5,425,277
Del. & Hudson	697,803	671,682	4,501,595	4,087,557
Pennsylvania	369,550	406,760	3,339,504	3,623,848
Erie	660,010	717,201	4,407,092	4,707,228
Ont. & Western	201,910	202,362	1,195,810	1,350,845
	4,934,205	5,391,857	36,529,509	38,337,646

Stocks at Tidewater July 31 were 636,384 tons.

SAULT STE. MARIE

Anthracite shipments through the Sault Ste. Marie Canals for July amounted to 315,374 tons and bituminous 1,759,178 tons.

THE CAR SITUATION

The total surplus of idle coal cars as of Aug. 10 was 74,488 and the shortage 414.

I. C. C. No. 6429—Parlin & Orendorff Co. vs. Cleveland, Cincinnati, Chicago & St. Louis R.R. Co., Et al.

Carload rate of $1.60 per ton on coke from Indianapolis, Ind., to Canton, Ill., not found unreasonable or unjustly discriminatory. Complaint dismissed.

Investigation and Suspension Docket No. 525—Coal rates from Illinois Mines to Omaha, Neb, and other points.

Proposed increase, from $2.05 to $2.25 per net ton, in the rate on bituminous coal from points on the Southern Railway in the Belleville district in Illinois to Omaha, Neb., and points grouped therewith, found to have been justified.

I. C. C. No. 7408—Reeves Coal Co., vs. Pere Marquette R.R. Co., et al.

A shipment of bituminous coal en route from La Follette, Tenn., to Vermilion, S. D., was ordered reconsigned to Ghent, Minn. Defendants failed to effect the reconsignment and higher charges were collected than would have accrued if complainant's instructions had been followed. Reparation awarded.

FOREIGN MARKETS

GREAT BRITAIN

July 30—The attention of the coal industry during the past week has been concentrated upon the Government's legislative efforts to limit prices, the chief new feature of which has been the decision of Mr. Runciman, at the eleventh hour, to partly include existing contracts within the scope of the act, after repeatedly declaring that he could consider nothing of the kind. No doubt the measure will cause much dissatisfaction in various ways, but the whole industry will doubtless be relieved to find that it knows the worst. The passage of the bill, which received the Royal assent yesterday, will at least enable traders to realize their actual position under the new measure and afford a basis upon which much business, which was suspended pending definite knowledge as to the intentions of the Government, can now be completed.—"The Iron and Coal Trades Review."

July 29—Business is virtually at a standstill as colliery owners are unable to accept fresh orders for prompt delivery. Colliery outputs are limited and as the authorities are taking a large proportion of the production, there is no prospect of a change for some little time. The following are the nominal quotations:

Best Welsh steam	Nominal	Best Monmouthshires	$6.96@7.20
Best seconds	Nominal	Seconds	6.72@6.96
Seconds	$6.96@7.20	Best Cardiff smalls	5.37@5.64
Best dry coals	6.72@7.20	Cargo smalls	4.44@4.80

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Chartering is much restricted owing to the scarcity of coal. Rates are nominally as follows:

Gibraltar	$3.36	Naples	$3.96	St. Vincent	$4.32
Marseilles	3.48	Alexandria	4.20	Rio de Janeiro	5.52
Algiers	3 89	Port Said	4.08	Monte Video	5.28
Genoa	3.99	Las Palmas	4.08	River Plate	5.52

FINANCIAL

St. Louis Rocky Mountain & Pacific Co.

(Seventh Annual Report—Year ended June 30, 1914.)

President J. van Houten reports for the year ended Sept. 15 as follows:

Results—The gross earnings were $2,457,178 [showing an increase of $217,694]; net earnings, $823,517. After deducting fixed charges, reserves for depreciation, etc., there is a net income for the year of $229,180.

Reduction of Liabilities—The company paid to the sinking fund Apr. 1, 1914, 3c. per ton on all coal mined during the preceding year, with which the trustee purchased and retired $47,000 bonds. Two-thirds of this amount was voluntarily paid in, as the mortgage requires the payment of only 1c. per ton of coal mined.

Improvements and Betterments—The disbursements during the year for improvements, betterments, additions, equipment, etc., at all the mines aggregated $109,886, of which $55,710 went for electrical equipment and power plants.

Sale of Railway—Change in Mortgage—The bondholders have been advised by circular of the plan of the directors (a) to sell the property of the St. Louis Rocky Mountain & Pacific Ry. to Atchison, Topeka & Santa Fé Ry. Co. for $3,000,000 Atchison 4% first mortgage gold bonds (a first lien on the property sold), and $50,000 in cash; and (b) to amend the gold mortgage of July 1, 1905, in a manner to enable the sale, to increase the annual sinking-fund payment to 3c. per ton of coal mined instead of 1c., and also to terminate the authority to issue additional bonds for extensions or betterments of the railway.

Electric Power—Your board has contracted with the Trinidad Electric Transmission Ry. & Gas Co. for all of the power used at your mines at a figure, which will not only enable us to make some saving in operating cost, but will also diminish the cost of opening new mines from time to time, as it will do away with the necessity of building individual power plants.

Dividends—The regular 5% for the year was paid on the preferred stock and 1% was paid on the common stock.

Outlook—The condition of our properties is satisfactory in every way. The market for coal in the Southwestern portion of the United States showed some improvement, and for coke a substantial increase over previous year, but there was almost a complete suspension of shipments to smelters, railroads and other customers in Mexico on account of the war and unsettled conditions in that country.

INCOME ACCOUNT FOR YEARS ENDING JUNE 30

	1913-14	1912-13	1911-12	1910-11
Coal mined (tons)	(?)	1,326,521	1,167,985	1,257,052
Coke produced (tons)	(?)	153,510	69,655	103,327
Coal and coke sales rev. from transport'n, etc	$2,276,868	$2,141,9313	$1,812,573	$2,010,115
Cost, expenses and taxes	1,633,661	1,621,999	1,304,819	1,382,125
Net earnings	$643,207	$519,914	$507,754	$627,990
Other income	180,310	97,571	98,335	88,508
Total net income	$823,517	$617,485	$606,089	$716,498
Interest charges	468,894	385,956	388,368	372,168
Other deductions				14,032
Reserved for depreciation and renewals	107,443	113,294	101,700	101,012
Pref. dividends (5%)	50,000	50,000	.....	.....
Common dividends (1%)	100,000	.....	.....	.....
Surplus	$79,180	$68,235	$116,021	$227,466

CONSOLIDATED BALANCE SHEET, JUNE 30

Assets—	1914 $	1913 $	Liabilities—		
Property and equipment	a12,285,762	a19,448,630	St. L.R.M. & P. Co.		
Invest. in sub. cos	301,782	320,877	Common stock	10,000,000	10,000,000
Invest. in and adv. to St. L. R. Mt. & Pac. Ry	a7,234,201	a	Preferred stock	1,000,000	1,000,000
Cash	413,810	389,560	First M. bonds	7,559,000	7,609,000
Accts. receivable	242,579	245,088	Accts. and wages pay	160,530	153,150
Coal and coke on hand	11,543	11,449	Notes payable	.....	10,000
Sundry accounts	13,201	9,532	Accured int., etc.	190,425	190,530
Mater. and supplies	24,322	86,742	Pref. stock divs.	12,529	12,529
			Sundry accounts	23,483	8,297
			Reserved for depr	535,583	561,739
			Surplus	1,045,650	969,471
Total	20,527,200	20,511,878	Total	20,527,200	20,511,878

a The St. Louis Rocky Mountain & Pacific Ry. Co. is being operated by the Atchison, Topeka & Santa Fe Ry. under an option to purchase prior to July 1, 1915, the consideration being $3,000,000 4% bonds of A. T. & S. F. Co., payable as of Aug. 1, 1913; also a cash payment of $50,000 for materials and supplies on hand Aug. 1, 1913.

Note—For previous annual report of the company see Vol. V, p. 924.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

✚Indicates contracts regarding which official information has been received.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week. The table gives our contract number, the name of the purchaser, city, tonnage and page on which the detail notice appeared.

No.	Purchaser	City	State	Tonnage	Page
1012	Geo. M. Kellogg Co.	Pleasant Hill	Mo.	20 (cars)e	243
1034	Board of Education	Youngstown	Ohio	5,000	243
1043	L. A. Budlong Co.	Chicago	Ill.	12(cars)	116
1048	Colin Gardner Paper Co.	Middletown	Ohio	50,000	116
1123	Indiana State Sch. of Deaf	Indianapolis	Ind.	4,000a	158
1198	Ohio B. Administration	Columbus	Ohio	20,000	244
1206	E. D. Skinner	Sawyer	N. D.	100	244
1210	The County Government	Buffalo	Minn.	100a	245

a Indicates bituminous. [2] Per month.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

1021—Kansas City, Mo.—The Western Sash & Door Co. announce that they will not contract as previously noted (p. 77). Address, F. J. Huttig, Western Sash & Door Co., Independence Bd. & White Ave., Kansas City, Mo.

1050—Kansas City, Mo.—Baker & Lockwood advise that no definite time has been set for letting this contract (p. 116), and that they may confine their purchases to the open market. Address Pur. Agt. C. R. Summerville, Baker & Lockwood, Wyandotte and 6th St., Kansas City, Mo.

✚**1051—Zanesville, Ohio**—This contract (p. 116) will be let to local dealers who are able to make deliveries to the school buildings as required. Address Clk. C. J. Weaver, Bd. of Edu., Zanesville, Ohio.

✚**1058—Plymouth, Mass.**—Bids have been received on this contract (p. 116), which provide for furnishing the county commissioners with coal, as follows:

	Lehigh Egg Coal	Pocahontas or Equal Grade
E. P. Reed Lumber Co., No. Abington	$6.40@6.60	$4.95
D. H. Craig, Plymouth	6.65	4.25
James Millar & Co., Plymouth	6.95	...
E. M. Alden Co., 94 Milk St., Boston	6.45@6.65	4.20

No notice has been received of any award as yet. Address County Comr. Lyman P. Thomas, Plymouth, Mass.

1060—Louisville, Ky.—This contract (p. 116), which provides for furnishing B. F. Avery & Sons with six months' supply of nut and slack coal, will not be awarded until about Aug. 15. Address Pur. Agt. J. W. Roelker, B. F. Avery & Sons, Louisville, Ky.

✚**1068—New York, N. Y.**—All the bids on this contract (pp. 117, 243) have been rejected and new bids requested, which were opened Aug. 13. The amount of tonnage involved has been reduced from 3000 gross tons of egg coal to 1500 tons. Address Dock. Comr. R. A. C. Smith, Pier A, North River, New York.

✚**1125—Columbus, Ohio**—All the bids on this contract (p. 158), which provides for furnishing the Department of Public Safety with 1250 tons of the best quality lump coal, have been rejected because of the reduction in freight rates of 15c. on the Hocking Valley Ry., which it is believed will affect the cost of the coal here. The new bids have been readvertised for and will be opened Aug. 17. The bids received on the present schedule were as follows: General Hocking Fuel Co., Columbus, West Virginia mine-run, $1.60; Hatton, Brown & Co., Columbus, Logan nut and slack, $1.45; Logan mine-run, $1.71; John M. Taylor Coal Co., Columbus, Hocking mine-run, $1.55; National Coal Co., Cleveland, Cambridge Hocking mine-run, $1.70; Victoria Coal Co., Columbus, Hocking nut, pea and slack, $1.23; Hocking mine-run, $1.53; New York Coal Co., Columbus, Hocking mine-run, $1.65; Moreland Coke Co., Pittsburgh, West Virginia mine-run, $1.58; Fletcher, Willaims Coal Co., Columbus, West Virginia nut, pea and slack, $1.12; West Virginia mine-run, $1.45; Elk Coal Co., Columbus, Cambridge Hocking, mine-run, $1.44; Hocking mine-run, $1.48; E. A. Cole & Co., Columbus, West Virginia mine-run, $1.64; Hocking mine-run, $1.64. Address Dir. of Public Safety B. L. Bargar, City Hall, Columbus, Ohio.

✚**1143—Spokane, Wash.**—Bids on this contract (p. 199), which provides for furnishing coal for Lewis and Clark and North Central High Schools and Boulevard Park School were received until 7:30 p.m., Aug. 9. A certified check for $100 was required with each bid. Address Secy. E. A. Thomas, Bd. of Edu., Spokane, Wash.

✚**1146—Wichita, Kan.**—This contract (p. 199), which provides for furnishing the local Board of Education with approximately 2500 tons of bituminous and semibituminous coal will be awarded Aug. 16. Address Clk. J. L. Leland, Bd. of Edu., City Hall, Wichita, Kan.

New Business

✚**1233—Dickinson, N. D.**—The School Board at this place received bids until noon Aug. 10 for furnishing 500 tons of either mine-run or screened lignite coal, to be delivered at the local school buildings during the ensuing year. The successful bidder will be required to furnish a bond for $200. Address Clk. L. R. Merritt, Bd. of Edu. Dickinson, N. D.

1234—Kansas City, Mo.—The Consumers Bread Co. at this place consumes about 150 tons of coal per month, which they are at present buying in the open market, but are willing to consider a proposition for contracting. Cherokee slack coal is used. Address Pres. B. Howard Smith, Consumers Bread Co., Orear-Leslie Bldg., Kansas City, Mo.

1235—Chicago, Ill.—The American Linseed Co., of South Chicago, will contract about Sept. 15 for their annual requirements of coal, involving approximately 15,000 tons. Illinois or Indiana mine-run coal is used, and the contract will extend over one year. Address Purchasing Agent, American Linseed Co., South Chicago, Ill.

1236—Kansas City, Kan.—The packing house of Sulzberger & Sons at this place will not enter into a contract this year, but are willing to consider propositions to furnish their fuel requirements. They consume about 200 tons of slack coal per day. Address Purchasing Agent, Sulzberger & Sons, Kansas City, Kan.

✚**1237—Hamilton, Ohio**—The Municipal Light and Power Plant at this place usually contracts some time in September for their annual requirements of coal, amounting to from 10,000 to 15,000 tons. Nut and slack grades are required and the usual price is $1.80 per ton. Address J. O'Toole, Municipal Light and Water Plant, Hamilton, Ohio.

✚**1238—Delaware, Ohio**—The Board of Education for Delaware Township will receive sealed bids for furnishing coal required for various school buildings during the ensuing year until 8 p.m., Aug. 14. Bids are requested on Hocking, West Virginia, or Sunday Creek forked coal. Address Clk. E. E. Moeller, Delaware Township, Bd. of Edu, Delaware, Ohio.

✚**1239—Brookings, S. D.**—The Board of County Commissioners, will receive bids until 2 p.m., Sept. 7, for furnishing 100 tons of bituminous, and 20 tons of anthracite coal. Address County Audr. F. H. Ripley, Bd. of County Comrs. Brookings, S. D.

✚**1240—Bellwood, Penn.**—The Board of Education of Bellwood received sealed bids until 8 p.m., Aug. 6, for furnishing approximately 200 tons of bituminous mine-run coal to be delivered to the local school as required during the ensuing year. Address, Secy., E. N. Root, Bd. of School Dirs., School Dist. of Bellwood, Bellwood, Penn.

1241—Kansas City, Mo.—The Atlas Oats Co. at this place is buying coal in the open market, and will probably continue doing so, but is willing to consider a proposition covering

two cars of Cherokee lump or nut coal per week. Address Purchasing Agent, Atlas Oats Co., 8th and Santa Fé St., Kansas City, Mo.

✚**1242—Jamestown, N. D.**—The county government will receive bids until 2 p.m., Sept. 1, for furnishing 150 tons of lignite and 75 tons of smokeless. Bids should be submitted f.o.b. cars at Jamestown, and also delivered in bins at the court house. A bid on 20 tons of anthracite stove coal will also be received. Address County Auditor, Jamestown, N. D.

1243—Crystal Falls, Mich.—The Municipal Light and Water Plant at this place usually contracts some time in September for annual requirements of coal amounting to about 150 tons. Furnace coal is used almost exclusively, and the usual price is $8.25 per ton. Address City Clk. W. J. Gribble, Crystal Falls, Mich.

✚**1244—Delaware, Ohio**—The county commissioners received sealed bids up to noon, Aug. 29, for furnishing 240 tons of 3-in. coal and 40 tons of washed nut, f.o.b. cars at Leonardsburg, Ohio. Address County Audr. W. D. Aldrich, Leonardsburg, Ohio.

✚**1245—Missoula, Mont.**—The Board of Education at this place received sealed bids until 10 a.m., Aug. 13, for furnishing between 250 and 300 tons of coal to the high school building or gymnasium as may be required during the ensuing year. Address Secy. A. J. Violette, Bd. of Trustees, County High School, Missoula, Mont.

✚**1246—Fairmont, N. D.**—The School Board here received bids until noon, Aug. 10, for furnishing two carloads of stove coal, one to be delivered in August and the other in January. Address Clk. F. E. Crafts, Bd. of Edu., Fairmont, N. D.

✚**1247—Jacksonville, Ill.**—The Board of Education here received sealed bids until noon, Aug. 10, for furnishing coal to the public schools during the ensuing year. Mine-run and 3-in. lump are required. Address Clk. R. L. Pyatt, Bd. of Edu., Jacksonville, Ill.

✚**1248—Lake Park, Minn.**—The Board of Education will receive bids until 6 p.m., Aug. 16, for furnishing 60 tons of Hocking Valley lump coal to be delivered on or before Sept. 1. Address Secy. Kristofer Delager, Bd. of Edu., Lake Park, Minn.

✚**1249—Ellwood City, Penn.**—The Board of Education received sealed bids until 8 p.m., Aug. 13, for furnishing three-quarter lump, mine-run, pea and slack coal, to be delivered to the local schools as follows: Lawrence, 125 tons; Central school, 100 tons; West End, 50 tons; Circle, 50 tons; North Side, 40 tons. Address Secy. W. J. Moore, Bd. of Edu., Ellwood City, Penn.

✚**1250—Falls City, Neb.**—The Board of Education received bids until Aug. 12 for furnishing 250 tons of steam coal for the high school and 125 tons of screened lump for the other buildings, 75 tons of lump coal to be delivered immediately and 50 tons the first of the year. Address Secy. F. Brecht, Bd. of Edu., Falls City, Neb.

1251—Redfield, Iowa—The Independent School District will receive bids until 2 p.m., Aug. 16, for furnishing approximately 100 tons of coal, one carload to be delivered by Sept. 15 and the balance as required. Address Clk. R. V. Seaman, Independent School District, Redfield, Iowa.

1252—Minot, N. D.—Sealed bids were received until 2 p.m., Aug. 10, for furnishing lignite coal to Schools Nos. 1, 2, 3 and 4 of the Burlington School District No. 7. Address Clk. W. E. Gross, Burlington School District No. 7, Minot, N. D.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

✚**No 691—Watervliet, N. Y.**—This contract (Vol. 7, pp. 877, 1083), which provides for furnishing the Watervliet Arsenal with coal during the year ending June 30, has been awarded to the **Peterson & Parker Coal Co.,** Troy, N. Y., on the following basis: Bituminous steam, $3.50; anthracite pea, $3.95; buckwheat No. 1, $3.20 and No. 2, $2.40. Address Col. W. W. Gibson, Ordnance Dept., United States Army, Watervliet Arsenal, Watervliet, N. Y.

✚**No. 801—Henderson, Ky.**—This contract (Vol. 7, pp. 1005, 1126, Vol. 8, p. 198), which provides for furnishing the local electric light station with approximately 9000 tons of pea and slack coal has been awarded to **R. A. Powell** of the St. Bernard Mining Co., at 85c. per ton. Address Supt. L. P. Hite, Municipal Light Station, Henderson, Ky.

✚**No. 821—Cranston, R. I.**—This contract (Vol. 7, p. 1049, Vol. 8, p. 243), which provides for furnishing the local city government with approximately 1000 tons of white ash egg and stove coal has been awarded to the **Robert E. Smith Co.** and the **Eastern Coal Co.,** both of whom bid $6.36 per ton. H. C. Banows & Sons bid $6.74 per ton and the United Coal Co., $6.65 per ton. Address Deputy City Clk. L. A. Smith, Jr., City Hall, Cranston, R. I.

✚**848—Chicago, Ill.**—This contract (Vol. 7, p. **1049,** Vol. 8, p. 198), which provides for furnishing the Board of Education with its fuel requirements during the ensuing year has been awarded as follows:

		Ton	Total
District No. 1			
J. J. Connors	Lump	$2.73	$23,178.00
Edgewater Coal Co	Nut	2.6704	4,539.68
J. J. Connors	Washed nut	2.643	2,643.00
Edgewater Coal Co	Small egg	7.55	528.50
Edgewater Coal Co	Range	7.55	981.50
Edgewater Coal Co	Chestnut	7.80	70.20
District No. 2			
Worth-Huskey Coal Co	Lump	2.907	11,628.00
Consumers Co	Small egg	7.85	117.75
Consumers Co	Range	7.85	1,703.45
Consumers Co	Chestnut	8.10	40.50
District No. 3			
Franklin Coal Co	Lump	2.714	24,263.16
J. J. Connors	Screenings	2.20	4,400.00
Consumers Co	Range	7.24	477.84
Consumers Co	Chestnut	7.60	387.60
District No. 4			
Franklin Coal Co	Lump	2.77	23,558.85
Bunge Bros. Coal Co	Mine run	4.00	120.00
Alwart Bros. Coal Co	Washed nut	2.82	3,666.00
Bunge Bros. Coal Co	Small egg	7.53	579.81
Bunge Bros. Coal Co	Range	7.53	1,046.67
Consumers Co	Chestnut	8.10	275.40
District No. 5			
Franklin Coal Co	Lump	2.714	30,125.40
Pilsen Coal Co	Mine run	3.805	1,179.55
Consumers Co	Range	7.24	1,766.56
Consumers Co	Chestnut	7.60	372.40
District No. 6			
Franklin Coal Co	Lump	2.77	12,949.75
Bunge Bros. Coal Co	Screenings	2.22	3,330.00
Consumers Co	Small egg	7.35	661.50
Consumers Co	Range	7.24	1,491.44
Consumers Co	Chestnut	7.60	205.20
District No. 7			
David Rutter & Co	Lump	2.811	40,492.46
Pilsen Coal Co	Mine run	3.805	1,902.50
Pilsen Coal Co	Washed nut	2.7845	1,392.25
Bunge Bros. Coal Co	Range	7.53	1,039.14
Consumers Co	Chestnut	7.5882	1,487.29
District No. 8			
Franklin Coal Co	Lump	2.714	45,649.48
Alwart Bros. Coal Co	Washed nut	2.82	3,666.00
Pilsen Coal Co	Screenings	2.205	4,410.00
Bunge Bros. Coal Co	Range	7.53	2,853.87
Consumers Co	Chestnut	7.60	714.40
District No. 9			
David Rutter & Co	Lump	2.811	35,671.50
Ready & Callaghan C. Co	Mine run	3.70	1,480.00
Bishop-Hamlin Coal Co	Nut	2.7138	4,070.70
Consumers Co	Range	7.5465	754.65
Consumers Co	Chestnut	7.60	448.40
District No. 10			
Worth-Huskey Coal Co	Lump	2.819	18,464.45
Consumers Co	Mine run	4.05	486.00
Consumers Co	Small egg	7.5465	928.22
Consumers Co	Range	7.434	1,129.97
A. L. Strachan & Son	Chestnut	7.80	413.40
District No. 11			
Henry Holverscheid & Co	Lump	2.72	16,972.80
Calumet Coal & Teaming Co	Small egg	8.00	600.00
Bishop-Hamlin Coal Co	Range	7.8614	1,100.60
Consumers Co	Chestnut	8.065	296.47
District No. 12			
Worth-Huskey Coal Co	Lump	2.819	14,489.66
Bishop-Hamlin Coal Co	Screenings	2.1336	5,974.08
A. L. Strachan & Son	Range	7.85	1,004.80
A. L. Strachan & Son	Chestnut	8.00	152.00
District No. 13			
Bishop-Hamlin Coal Co	Lump	2.837	3,093.96
Consumers Co	Small egg	8.10	405.00
Calumet Coal & Teaming Co	Range	8.50	552.50
Consumers Co	Chestnut	8.35	50.10
District No. 14			
Bishop-Hamlin Coal Co	Lump	2.806	12,[illegible]6.10
Consumers Co	Mine run	4.05	[illegible]4.50
Bishop-Hamlin Coal Co	Nut	2.8377	[illegible]8.90
Consumers Co	Range	8.10	1,[illegible]0.20
Consumers Co	Chestnut	8.446	[illegible]2.23
John Worthy School			
Worth-Huskey Coal Co	Lump	3.528	2,[illegible]6.00

Approximate total expenditure for coal, $385,241.38. Address Business Mgr. J. A. Guilford, Board of Education, Tribune Bldg., Chicago, Ill.

✚**No. 861—Newberry, Mich.**—This contract (Vol. 7, p. 1[illegible]5), which provides for furnishing the Newberry State Hospital with approximately 6000 tons of bituminous and semi-bituminous coal, as required during the ensuing year, has been awarded to the **Island Creek Coal Sales Co.,** Detroit, Mich., at $3.45 per ton for mine-run coal. Address Secy. Dr. [illegible]. H. Campbell, Newberry State Hospital, Newberry, Mich.

No. 930—East St. Louis, Ill.—This contract (Vol. 7, p. 1127), which provides for furnishing coal to the public schools was

awarded to the **Frank Maule Coal Co.** of East St. Louis. The coal to be furnished is 2-in. shaker screen lump from the mines of the St. Louis & O'Fallon Coal Co. The Maule bid was $1.59 per ton delivered, which figures 88c. per ton at the mine as the freight is 32c. and the hauling 40c. The other bids were: Helfrich Coal Co., $1.59 for one of the four groups; Donk Bros. Coal & Coke Co., $1.65; Fowler-Senior Coal Co., $1.68; Boehmer Coal Co., $1.68½; Carter Bros., $1.71; P. H. Huschle Coal Co., $1.75. The Maule company had the contract last year at $1.59¾. Address, Board of Education, East St. Louis, Ill.

+No. 951—Knoxville, Tenn.—This contract (p. 40), which provides for furnishing the local Board of Education with its coal supply during the ensuing year, has been awarded to **Church & Co.** Address Fred W. Keith, Bd. of Edu., Knoxville, Tenn.

No. 955—Manistee, Mich.—The Manistee Flouring Mill Co. of this place announces that it has covered its requirements as previously noted (p. 40). No details are available as to prices. Address Pres. G. A. Hart, Manistee Flouring Mill Co., Manistee, Mich.

No. 962—New Orleans, La.—This contract (p. 41), which provides for furnishing the New Orleans Coöperative Butchers' Abattoir with 600 tons of bituminous coal, has been awarded to the **Tennessee Coal & Iron Co.** Address New Orleans Butchers' Abattoir, North Peters and Alabo Sts., New Orleans, La.

+No. 967—Aspinwall, Penn.—This contract (Vol. 8, p. 41), which provides for furnishing the local City Government with about 100 tons of coal per month, has been awarded to the **Cornell Coal Co.** at $1.50 per ton for nut, $1.35 for nut and slack and $1.30 for slack. Address Borough Clk. S. R. Chase, 230 First St., Aspinwall, Penn.

+No. 968—Van Wert, Ohio—This contract (p. 41), which provides for furnishing the local Board of Education with approximately 400 tons of coal has been awarded to **Rupright Bros.** on West Virginia mine-run coal at $2.85 per ton. The coal will be furnished from the company's Fairmount Mine. Address Secy. J. M. Showalter, Bd. of Edu. Van Wert, Ohio.

No. 969—Hillsboro, N. D.—This contract (p. 41), which provides for furnishing approximately 200 tons of Pocahontas smokeless mine-run coal has been awarded to the **Valley Lumber Co.,** at $5.65 per ton. The Monarch Elevator Co. bid $5.88 per ton. Address County Audr. Nels O. Lindaas, Bd. of County Comrs., Hillsboro, N. D.

No. 973—St. Cloud, Minn.—This contract (p. 41), which provides for furnishing the Board of Education with 300 tons of bituminous coal, has been awarded to the **Central Lumber Co.** at $5.50 per ton delivered in the bins. It is understood that the contract will be filled on southern Illinois Coal. Address Secy. Julius Adams, Bd. of Edu., St. Cloud, Minn.

No. 977—Brazil, Ind.—This contract (p. 41), which provides for furnishing the local Board of Education with approximately 100 tons of screened coal during the ensuing year, has been awarded to the **West Side Coal Co.,** on screened block coal at $2.30 per ton. Address Secy. H. D. Falls, Bd. of Edu. Brazil, Ind.

+No. 989—Frankfort, Ky.—This contract (p. 42), which provides for furnishing the State Charitable Institutions with coal has been awarded as follows: Eastern State Hospital, **C. L. Ryley Coal Co.,** $2.10 for mine-run coal; Feeble-minded Institute, **R. A. Brawner,** nut and slack coal at $2.10 per ton; Central State Hospital, **R. C. Tway Coal Co.,** nut and slack at $2.15 per ton; Western State Hospital, **St Bernard Coal Co.,** pea and slack at 89c. per ton. Address Secy. Geo. B. Caywood, Kentucky State Board of Control for Charitable Institutions, Capitol, Frankfort, Ky.

+No. 991—Storrs, Conn.—This contract (pp. 76, 115), which provides for furnishing the Connecticut Agricultural College with anthracite coal has been awarded to **F. H. & A. H. Chappell** at the following figures: 1000 tons anthracite egg $6.80; 200 tons pea at $4.95; 100 tons of stove $6.80; 50 tons nut at $7.05. Address Connecticut Agricultural College, Storrs, Conn.

No. 992—Rock Island, Ill.—This contract (pp. 76, 158), which provides for furnishing the Standard Oil-Cloth Co. with two cars of screenings per week, has been awarded to the **W. G. Block Co.,** Davenport, Iowa. Address Purchasing Agent, Standard Oil-Cloth Co., Rock Island, Ill.

No. 994—Canton, Ill.—This contract (Vol. 8, p. 76), which provides for furnishing the coal required at the Ave. D Pumping Station during the year beginning July 1, has been awarded to **W. S. Middleton** at $1.43¾ per ton for mine-run coal. Address City Clk. Joseph Waugh, Canton, Ill.

No. 995—Cedar Rapids, Iowa—This contract (p. 76), which provides for furnishing the Board of Education with 5000 tons of bituminous and 60 tons of anthracite, has been awarded as follows: **E. E. Pinney Coal Co.,** screenings, $1.91; **W. G. Black Co.,** anthracite, $8.96; **Hawkeye Lumber & Coal Co.,** lump, $3.60. The screenings are to come from Rosehill, Iowa, and the lump from Pyrolite. Address Secy. H. L. Cooper, Bd. of Edu., Cedar Rapids, Iowa.

+No. 998—Kansas City, Kan.—This contract (p. 77), which provides for furnishing the Water Works with approximately 20,000 tons of mill and slack coal has been awarded to the **Wyandotte Coal & Lime Co.,** at $2.20 for Cherokee mill and $2.05 for Cherokee slack coal. The same company obtained the business last year at $2.25 per ton for both mill and slack. Most of the coal will be slack coal. The gross consideration amounts to about $55,000. Address Purch. Agt. Amos Riddle, City Hall, Kansas City, Kan.

+No. 999—Brookville, Ohio—This contract (p. 77), which provides for furnishing the Board of Education with 75 tons of coal, has been awarded to **Theo. Detwiler,** on Pocahontas No. 3 mine-run, at $3.20 per ton. Address Clk. J. M. Grau, Bd. of Edu., Brookville, Ohio.

1002—Lafayette, Ind.—This contract (p. 77), which provides for furnishing the fuel requirements of the Public Works Dept., has been awarded to the **J. M. Clark Coal Co.,** of Lafayette, Ind., on coal from their Lattas Creek mine, which operates on the Linton No. 4 seam, on the following basis: 5000 tons nut, pea and slack, $1.53; 700 tons of mine-run, $2.18; 275 tons of mine-run at $2.08. Address Supt. M. W. Miller, Water Works Dept., Lafayette, Ind.

+1008—Galesburg, Ill.—This contract (p. 77), which provides for furnishing the Knox County Court House and heating plant with coal during the year beginning July 1, has been awarded to the **Spoon River Colliery Co.** and the **Virden Coal Co.** It is understood that the price is $1.65 per ton on a delivered basis for Peoria egg screenings. Address County Clk. F. L. Adams, Galesburg, Ill.

+1011—Ritzville, Wash.—This contract (p. 77), which provides for furnishing the various school buildings with 125 tons of coal has been awarded to the **St. Paul & Tacoma Lumber Co.** at $5.20 per net ton for Roslyn Cascade Special steam coal. Address Dist. Clk. John Truax, School Dist. No. 1, Ritzville, Wash.

1013—Jackson, Miss.—This contract (p. 77), which provides for furnishing the State Penitentiary with coal, has been awarded as follows: **Memphis Coal Co.,** for delivery at Parchman, Miss., $3.50; **Morrison Coal Co.,** for delivery at Oakley, mine-run, $2.95. Address Secy. J. J. Coman, Mississippi State Penitentiary, Jackson, Miss.

1014—Keewatin, Minn.—This contract (p. 77), which provides for furnishing the town government with approximately 5000 tons of coal, has been awarded to the **King Lumber Co.** on the following basis:

	Lump	Mine-run	Screenings
Kentucky Elkhorn.....	$4.89	$4.59	$3.95
Kentucky screenings	4.89	4.59	3.95
Youghiogheny screenings.....	4.54	4.24	3.64

Address Village Clk. C. W. Extrum, Keewatin, Minn.

+No. 1017—Mobile, Ala.—This contract (p. 77), which provides for furnishing a year's supply of coal to be delivered at the Spring Hill and Bienville Pumping Stations, has been awarded to the **Imperial Coal & Coke Co.** at $2.95 per ton delivered at the stations. The contract will be filled on washed screened nut, ¾x3½ in. with a guaranteed B.t.u. value of 15,050 and a maximum ash content of 1¾%. Address Supt. C. W. Joost, Mobile Water Works, Mobile, Ala.

+1027—Rapids City, S. D.—This contract (p. 115), which provides for furnishing the Independent School District with approximately 200 tons of coal has been awarded to **Thomas Roush.** The complete list of bids and prices were as follows:

Bidder	Coal	Lump	Egg	Nut
Rapids City Fuel Co.....	Sheridan	$4.40	$4.15	$3.65
Thomas Roush	Poposia	4.25	4.00	3.65
Mid West L. & C. Co.....	Kooi	4.25	4.00	

*Bids on Colorado coal ran from $6.75 to $7.25 per ton. Address Secy. W. F. Haafke, Ind. School District, Rapids City, S. D.

+1066—Pella, Iowa—This contract (pp. 116, 198), which provides for furnishing the local city electric light plant with lump, mine-run and steam coal has been awarded to the **Pella Coal Co.,** on the following basis: Lump, $2.93; mine-run, $2.75; steam, $1.65. Address City Clk. A. C. Kuyper, Pella, Iowa.

+1067—Springfield, Ohio—This contract (p. 117), which provides for furnishing the County Commissioners with approximately 800 tons of coal, has been awarded to **Chas. E. Grube Co.,** 400 tons for the County Infirmary, at $2 per ton,

and **Beckmley & Myers,** 400 tons for the Donnelsville Station, at $2.55 per ton. Address County Audr. J. M. Pierce, Springfield, Ohio.

+1069—Olivia, Minn.—This contract (p. 117), which provides for furnishing the local Board of Education with 100 tons of Youghiogheny lump coal was awarded to **William Windhorst,** the lowest bidder at $5.77 per ton. Address, Secy. Geo. E. Peterson, Bd. of Edu., Olivia, Minn.

+No. 1072—Wadena, Minn.—This contract (p. 117), which provides for furnishing the City Government with approximately 1000 tons of Youghiogheny mine-run coal, has been divided equally among the Denver Lumber Co., the Ebner Milling Co., and the Gnest Lumber Co., all of whom bid $3.10 per ton. The Monarch Elevator Co. bid $3.02 per ton, but the bid was rejected. Address Village Rec. A. C. Murray, Wadena, Minn.

+1073—Bridgeport, Conn.—This contract (p. 117), which provides for furnishing the City Department with approximately 500 tons of bituminous coal has been awarded to **Vincent Bros.,** of this place, at $3.74 per gross ton. This compares with $3.80 per ton last year. Address, City Clerk, Bridgeport, Conn.

1074—Buffalo, N. Y.—This contract (p. 117), which provides for furnishing the local Light House Department with coal, has been awarded to the **Ashtabula Steamship Co.,** of Buffalo, at $2.80 per ton for bituminous coal. Address Lighthouse Inspector Roscoe House, Buffalo, N. Y.

+1075—Louisville, Ky.—This contract (p. 117), which provides for furnishing the Louisville Industrial School of Reform with approximately 1000 tons of coal has been awarded to the **James & Dugan Coal Co.** on Harlan Co., Ky., nut at $2.65 per short ton. Address Secy. C. F. Leathers, Louisville Ind. School of Reform, Louisville, Ky.

+1078—Ionia, Mich.—This contract (p. 117), which provides for furnishing the Ionia State Hospital with approximately 2500 tons of bituminous nut, pea and slack coal has been awarded to **E. J. Corbett** at $2.48 per ton. This is the same party who had the contract during the past year. Address Medical Supt. Dr. R. H. Haskell, Ionia State Hospital, Ionia, Mich.

1082—Sioux Falls, S. D.—This contract (p. 117), which provides for furnishing about 1000 tons of coal, has been awarded to **H. T. Parmley,** of this place, on Elkhorn, Ky., coal at $5.10 per ton for screenings and $5.75 for mine-run. Address City Audr. Walter C. Leyse, Sioux Falls, S. D.

+1083—Richmond, Ind.—This contract (p. 117), which provides for furnishing the Wayne County Commissioners with coal, has been awarded to the following companies: **A. Harsh Coal Co.,** $3.05; **H. C. Bullerdick & Son,** $3.33; **Hackman & Klefoth,** $3.35; **Mather Bros. Co.,** $3.05. Address Audr. L. S. Bowman, County Comrs., Richmond, Ind.

+1084—New Lexington, Ohio—This contract (p. 117), which provides for furnishing the Board of Education with coal, has been awarded to **J. M. McCullough,** at $2.85 for lump coal. Delmar Spring bid $2.87½, and M. R. Hearing, $3.25 per ton. Address Clk. C. O. Ferguson, Bd. of Edu., Pleasant Township, New Lexington, Ohio

Contract Notes

York, Penn.—The contract for furnishing the local court house and county jail with coal was awarded to **W. T. Gerber** at $2.95 per ton for Miller vein coal.

Greensburg, Penn.—It is stated here that Pres. Jamison of the Jamison Coal & Coke Co., has closed a large contract for coal to be furnished the French Government.

Dubuque, Iowa—The contract for furnishing the local schools with coal during the ensuing year has been awarded to **Felix G. Becker** and **F. A. Burns,** the lowest bidders.

West Chester, Penn.—The contract for delivery of 300 tons of Lykens Valley pea coal to the Chester County Hospital has been awarded to **John H. Spear & Sons** at $4.54 per gross ton.

Birmingham, Ala.—In addition to previous contracts of this company (No. 598, Vol. 8, pp. 40, 78), the United Fruit Co. is said to have just closed a contract for 40,000 tons with the De Bardeleben Coal Co.

Pere Marquette R.R.—The fuel contract of this road has been let on Island Creek coal, it is understood at 75c. at the mines. The contract was divided among a number of operators in the Island Creek district.

Coke for Export—A commercial representative of a foreign government in Washington, D. C., reports that he is in receipt of requests for the name and addresses of American exporters of coke. Large quantities are desired.

Birmingham, Ala.—Press reports are to the effect that the Georgia Southern & Florida R.R. have closed their contract with the Sloss-Sheffield Steel & Iron Co. for 150,000 tons of coal to be furnished during the ensuing year.

Greenville, Penn.—The contract for furnishing the local schools with coal has been awarded to **N. W. Whitney** at $2.25 for screened lump at bank. The haulage charge will be 74c. Address Secy. I. C. Brown, School Bd., Greenville, Penn.

Walla Walla, Wash.—The contract for furnishing the local Board of Education with 600 tons of coal has been awarded to **Tausick & Kauffman** and **Arthur Thompson.** It is said the contract will be filled on Spring Cannon and Kemmerer grades.

New York, N. Y.—Pattison & Bowns have been awarded a contract for furnishing and delivering 3000 tons of egg coal to the Department of Docks and Ferries at $5.37 per ton. Streat Coal Co. bid $5.94; Gavin-Rowe bid $5.46; and W. P. W. Haff, $5.57.

Portsmouth, Ohio—The Whitaker Glessner Co. at this place consumes about 3000 tons of mine-run coal per year. Deliveries are by railroad at the rate of 60 tons per week. Address Pur. Agt. J. E. Thomas, Whitaker Glessner Co., Portsmouth, Ohio.

Berrien Springs, Mich.—The Emmanuel Missionary College buys their coal in the open market and their requirements for the ensuing year have already been covered. Address Asst. Mgr. Fred Green, Emmanuel Missionary College, Berrien Springs, Mich.

Wyndmoor, Penn.—The Springfield Township School Board has awarded the contract for the delivery of 160 tons of Lehigh stove coal to the schools of Wyndmoor, Whitemarsh, Oreland and Flourtown to **Zebedee Comly,** Flourtown, Penn., at price of $6.22 delivered in the cellars of the buildings.

Kansas City, Mo.—The contract for furnishing the local Water Works with coal, has been awarded to the Central Coal & Coke Co. at $2.20 per ton for mill and $2.05 for slack. The price for slack coal is the same this year as last, but the figure on mill coal represents a reduction of 14c. per ton. About 35,000 tons of coal is used altogether.

Weirton, W. Va.—The Phillips Sheet & Tin Plate Co. at this place consume 100,000 tons of slack, 20,000 tons of three quarter lump, and 5000 tons of mine-run coal per annum. Deliveries are made over the Pennsylvania and Wheeling & Lake Erie, at about the following rate per week: 400 tons of three-quarter; 100 tons of mine-run; 2000 tons of slack. The company has storage capacity for three days. Address Purchasing Agent J. F. Newman, Phillips Sheet & Tin Plate Co., Weirton, W. Va.

Portland, Me.—Randall & McAllister were awarded contract for supplying coal to the City of Portland as follows: Hard coal broken, white ash, $6.85; egg, $7.10; stove, $7.10; nut, $7.35; pea, $5.85. Soft coal: Pocahontas, $4.80; New River, $4.90; Big Vein Georges Creek Cumberland, $5. The other bidder was A. R. Wright Co. as follows: Broken, $6.90; egg and stove, $7.10; nut, $7.40; pea, $5.85; hard coal screenings, $2.25. Bituminous: Pocahontas or Georges Creek Cumberland, $5.10.

Indianapolis, Ind.—The Indianapolis Coal Co. and the Indianapolis Mortar & Fuel company were the only bidders for the contract to supply coal for the ensuing year to the police and fire departments. The former bid $3.25 for mine-run Pocahontas; $4.25 for Pocahontas lump; $3.15 for Kanawha lump and $7.25 for anthracite. The latter bid $3.25 for Pocahontas mine-run; $4.24 for Pocahontas lump; $3.34 for Kanawha lump and $7.24 for anthracite. The Indianapolis Mortar & Fuel Co. secured the contract over the protest of its competitor who insisted that as much more Kanawha was used than the other coals, its bids were the cheapest.

Columbus, Ohio—The contract for 15,000 tons of coal for the Ohio State University for the coming winter has been awarded to the **Lorain Coal & Dock Co.,** of Columbus at $1.19 for West Virginia nut and slack, delivered on the university switch. Other bids were: A. Simons & Son, Columbus, $1.35 for West Virginia nut and slack; Easthill Coal Co., Cincinnati, $1.39 for West Virginia nut and slack; Elk Coal Co., Columbus, $1.42 for West Virginia nut and slack; Halmar Coal Mining Co., Cincinnati, $1.16 for West Virginia nut and slack; Victoria Coal Co., Columbus, $1.15 for Hocking nut and slack; Chesapeake & Ohio Coal Co., Cincinnati, $2.15 for Pocahontas nut and slack and Moreland Coke Co., Cincinnati, $1.34¾ for West Virginia nut and slack. The contract was awarded to the Lorain Coal & Dock Co. because of a better analysis and will be shipped from the newly opened Logan County field. The university has facilities for the storage of between 1000 and 1200 tons and this will be filled and coal will then come forward at the rate of about three cars daily during the cold months.